Prior Art Search Overview

R&D Base demo User: dsabina@meuk

Projects | Reports | Administration | 1010x730 | help

All Fiscal Years

- 100 - HOW TO ENTER PROJECT DATA
- 1001 - HVAC development - TAX CASE (Airmax)
- 1002 - Software - New Web techniques for animation
- 1101 - FRANCAIS Machinerie - Améliorer l'équipement
- 1102 - Software - Data Warehouse Development
- 1201 - Chemicals - Optimize DA Catalyst Recipe
- 1202 - Software (Database Methodology)
- 1203 - Agriculture - Plant breeding
- 1204 - Composite materials - TAX CASE (Jentel)
- 1301 - Pump redesign
- 1303 - HVAC - How cost contraints affect a project
- 1305 - Glue development - Hypotheses formulation ex
- 1400 - Software R&D - International Guidelines (OECD
- 1401 - Miniature Printer - TAX CASE (6379249 Canada
- 1402 - Motor Assembly - TAX CASE CANADA (GE / MAI
- 1403 - Webcrawler development -TAX CASE (Highweb
- 1404 - Chocolate spread development - TAX CASE CAI
  - 1 - Technological uncertainty
- 1410 - Telecom soft & hardware - TAX CASE USA (Sud
- 1600 - RDBASE.NET - PUZZLE SOLUTIONS

Show the 10 closed Projects...
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Project 1401 - Miniature Printer - TAX CASE (6379249 Canada Inc.)

1 - Variables cited in tax case

Delete Uncertainty

Run Wizard>> | Home | I) Objectives | II) Uncertainties(2)>> | III) Activities(4)>> | Save | Next>>

Provide a short, descriptive title for each of the most significant variables to be researched

Overview | Run PAST | Prior Art

Select your initial search terms

Project name

- [ ] Miniature Printer - TAX CASE (6379249 Canada Inc.)

FOR Objectives

- [ ] Battery life
- [ ] Paper tension
- [ ] Paper straightness
- [ ] Max Dimensions
- [ ] Jam rate
- [ ] Ambient humidity limit
- [ ] Media thickness upper
- [ ] Media thickness lower range
- [ ] Speed (pages per minute)
- [ ] felt medium life
- [ ] Overall reject rate

BY Key variables(to achieve objectives)

- [ ] static versus dynamic load
- [ ] clutch plate surface area & use of ridges
- [x] slip clutch
- [ ] moisture vs anti curl mechanism
- [ ] felt (friction, compression & degradation)
- [ ] Spreader - flex, reverse crown, single or dual bow
- [ ] Drive methods, locations & timing
- [x] Tension: roller shape & materials

BY slip clutch&Tension: roller shape & materials

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Search Terms

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- [x] slip clutch
- [x] Tension: roller shape & materials

Custom Date Range

Start date: MM/DD/YYYY

End date: MM/DD/YYYY

[Mechanisms and mechanical devices sourcebook](#)
N Sclater, NP Chironis - 2001
... **Clutches** with External or Internal Control Spring-Wrapped **Clutch Slips** at Preset ... **Slip** Expands Spring **Clutch** Applications Spring Bands Improve Overrunning **Clutch Slip** and Bidirectional ... **Clutches** Ten Applications for Overrunning **Clutches** Eight Sprag **Clutch** Applications Six ...

[Stress analysis of a new disk-type variable torque **slipping clutch** with skewed **rollers**](#)
M Feng, K Ono, K Mimura - JSME International Journal Series C, 2003
... the driving and driven contact, respective- ly (s) : Indicates the parameter related to the **slip**-ping of ... r) and V'f\ respectively, and in the next movement from C to B' the **roller slips** only with ... Then, the magnitudes of the tangential and axial **slipping** are defined as Vtko) cos Zprj — V{til ...

[The Radio Astronomy Explorer 1500-ft-Long Antenna Array](#)
ED Angulo, WP Kamachaitis - Third Aerospace Mechanisms Symposium, Jet ..., 1968
... is applied by a **slip clutch** at the pinch drive **roller**, ... That is, drive principles such as motors, pinch drive **rollers**, drag **clutches**, rotating form- ... Since the force- sensing **roller** is restrained by two strands of tape, only half of F._.is applicable in calculating the element **tension**. ...

[Plastic elements in and around the engine](#)
J Rabe - International Journal of Vehicle Design, 1990
... Figure 23 Schematic CAD representation of the tendency of a **clutch** release bearing box to ... Wear is reduced through the uniform distribution of drive and **slip** forces. ... An automatic belt tensioning device with **tension** spring and hydraulic damper automatically **tensions** the drive ...

[**Slip clutch** for **roller shade**](#)

www.google.com/patents/US20140110212
App. - Filed Oct 18, 2012 - Published Apr 24, 2014 - Philip Ng - Philip Ng
The **slip clutch** comprises a clutch base with a shaft portion, a drive sprocket ... or counterclockwise rotation of the **roller** tube upon the application of **tension** to the .... a form of plastic, fibreglass, polycarbonate or other generally similar **material**.

[Process for treating filamentary **material**](#)

www.google.com/patents/US3469388
Grant - Filed Oct 26, 1967 - Issued Sep 30, 1969 - Peter Reeves Lord - Nat Res Dev
The **slipping clutch** or equivalent 7 is sensitive to yarn **tension** and ensures a ...

Use these menus to revise & narrow the search

Search Terms

Add your own

- [x] felt
- [x] miniature printer
- [x] slip clutch

Custom Date Range

Start date: MM/DD/YYYY

End date: MM/DD/YYYY

[A Compact Buoy System for Ship-Use in the Measurement of Ocean **Micro**-Structures over a Monthly Period](#)
R Frassetto - 1966
... A COMPACT BUOY SYSTEM FOR SHIP-USE IN THE MEASUREMENT OF OCEAN **MICRO**-STRUCTURES OVER A MONTHLY PERIOD By ... spool to the capstan, is made from a **felt**-lined disk and presses ... mechanically identical but make continuous recordings on **miniature**, ...

[Numerical and experimental investigation into porous squeeze films](#)
MMHM Ahmad, DT Gethin, TC Claypole, BJ Roylance - Tribology international, 1998
... When the model was applied to the parameters of the actual **printing** process, it was demonstrated that the volume flowrate of the ink dot which ... U s, **slip** velocity. ... Previous interest in this system stems from its application in self-lubricating bearings and in wet **clutch** applications. ...

Open similar items

[Existence of self-sustained oscillations in relay-type systems with hysteresis](#)
D Ciscato, G Marchesini, L Mariani - Electronics Letters, 1968
... continued J Recorder A **miniature** x,l_IPyf.i' portable recorder, the Servoscribe M is a compact battery ... A choice of an irilrless or **felt**-pen w-riting Decoder The 9307 decoder is a ... in hardware in- terfaces are available for a range of peripherals, including line **printers**, digital plotters ...

[VARIABLE-SPEED RECORDER-REPRODUCER](#)
T Lanyi, DE Reed - 1962
Page 1. UNCLASSIFIED AD 296 401 ARMED SERVICES TECHNICAL INFORMATION AGENCY ARLIN(FON HALL STATION ALINGIO 12, VIRGINIA UNCLASSIFIED Page 2. NOTICE: When government or other drawings speci- ...

[**Miniature** bulletin **printer**](#)

www.google.com/patents/US3201514
Grant - Filed Oct 19, 1961 - Issued Aug 17, 1965 - Bradbury Wilburn F - Scm Corp
A further object resides in the provision of a novel **miniature printer** utilizing selector ... FIGURE 4 is a view of the **slip clutch** mechanism located in the drive train .... by rotation of camshaft 76 through the medium of two oiled **felt** disks 112 and ...

[Vorrichtung zum transport eines farbbandes in einem seriell ...](#)

image not available

www.google.com/patents/DE3708029A1?cl=en
App. - Filed Mar 10, 1987 - Published Sep 22, 1988 - Harald Dipl Ing Schulz - Siemens Ag
A device for transporting an ink ribbon (19) in a serially operating **printer**, ... (12) is a direct current **miniature** motor, the operation when recording with a a winding

Example of patent review

- The next 8 slides illustrate how we could quickly review
- patents & prior art documents for ideas on
- existing methods
- to achieve desired objectives.

Google miniature bulletin printer

David

Patents

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Miniature bulletin printer

US 3201514 A

ABSTRACT available in

IMAGES (5)

Publication number	US3201514 A
Publication type	Grant
Publication date	Aug 17, 1965
Filing date	Oct 19, 1961
Priority date	Oct 19, 1961
Inventors	Bradbury Wilburn F, Kleinschmidt Edward E
Original Assignee	Scm Corp
Export Citation	BiBTeX, EndNote, RefMan

Patent Citations (7), Referenced by (9), Classifications (9)

External Links: USPTO, USPTO Assignment, Espacenet

Step 1: find relevant methods

Evaluate similar technologies for methods which could be used in our design.

DESCRIPTION (OCR text may contain errors)

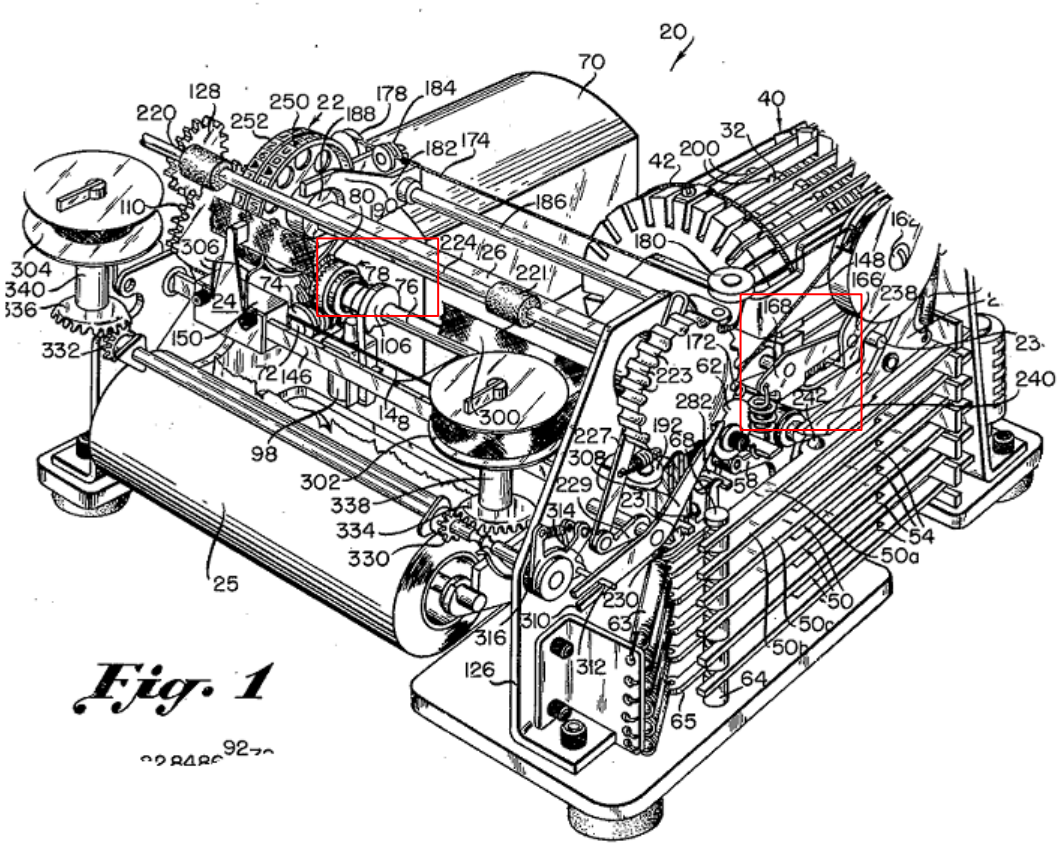
CLAIMS available in

Aug. 17, 1965 E. E. KLEINSCHMIDT ETAL MINIATURE BULLETIN PRINTER
SSheets-Sheet 1 Filed Oct. 19, 1961 INVENTORS Edward E. Kleinschmiclr Wilburn F Bradbury Wy 7W Attorneys Aug. 17, 1965 E. E. KLEINSCHMIDT ETAL 3,201,514

MINIATURE BULLETIN PRINTER 5 Sheets-Sheet 2 Filed Oct. 19, 1961 INVENTORS Edward E. Kleinschmidi Wilburn F Bradbury REVS 5 Sheets-Sheet 3 INVENTORS Edward E. Kle'inschmidt 7L 5 Attorneys Aug. 17, 1965 E. E. KLEINSCHMIDT ETAL MINIATURE BULLETIN PRINTER Filed Oct. 19. 1961 BY Wilburn FBrodbury Aug. 17, 1965 E. E. KLEINSCHMIDT ETAL 0 4 MINIATURE BULLETIN PRINTER Filed 001:. 19. 1961 5 Sheets-Sheet 4 Hull LLL III| INVENTORS Edward E. Kleinschmidt By Wilburn F Bradbury Attorneys United States Patent 3,201,514 MINEATURE BULLETIN PRINTER Edward E. Kleinschmidt, Miami Beach, Fla, and Wilhurn F. Bradbury, Northbroolr, IIL, assignors t0 SCM Corporation, New York, N.Y., a corporation of New York Filed Oct. 19, 1961, Ser. No. 146,105 50 Claims. (Cl. 178-33) The present invention relates to apparatus for receiving and recording coded signals and more particularly to a small compact bulletin printing apparatus exemplified in the following disclosure by what is commonly known to the telegraph industry as a printer. 7

Apparatus for receiving coded signals and automatically transforming them into recorded typographical characters for immediate reading .are well known in the art and usually consist of components such as a typewheel, print hammer and mechanism to select .a specific character .and to cause relative movement between the typewheel and print hammer, a reversible inked ribbon mechanism and a carrier and feed for the paper on which the message is printed.

In previously known equipment of this type, most of the above mentioned components are located on the front side of the



Freely rotatably mounted on the camshaft 76, as the input member of clutch 78,

A second **clutch** 168 of-the **slip coupling type** (see FIGURE 4) consisting of a large gear rotatably mounted on camshaft 76 and frictionally driven by rotation of camshaft 76 through the medium of **two oiled felt disks** 112 and 114 pressed together by compression spring 120. The slip clutch 108 is a necessary component due to the fact that camshaft 76 must be in motion even though the print wheel 22 and its associated selecting mechanism are stopped at the selected printing position.

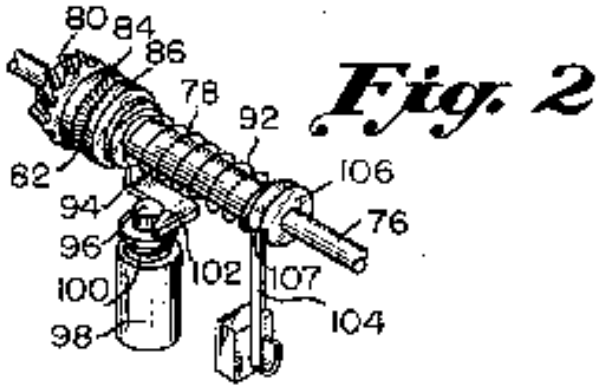


Fig. 2

FIGURE 2 is a detail perspective View of the positive cyclic clutch mechanism which can be seen below the typewheel in FIGURE 1 and which controls the camshaft cycles of rotation, the length being exaggerated for purposes of clarity.

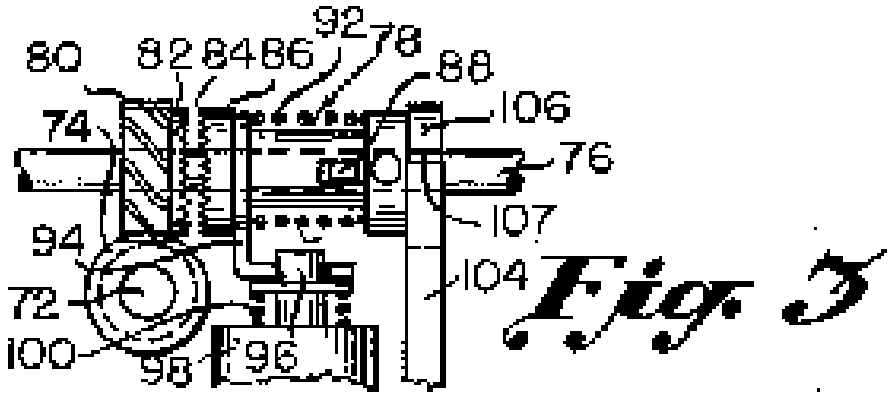
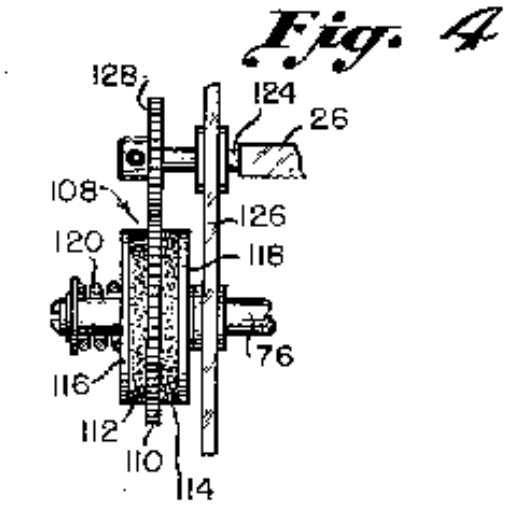


Fig. 3

FIGURE 3 is a further detail view of the positive clutch mechanism shown in FIGURE 2 and illustrates the manner in which the sliding clutch member is keyed to the camshaft;

The slidable member 86 (see FIGURE 3) is disposed on and keyed to the camshaft 76 by a cross key 88 whose ends fit in a slot 90 cut across the end of the slidable member 86.



Two oiled felt disks 112 and 114 and two Washers 116 and 118, the combination being pressed together with the felt disks bearing against the gear 110 by the force of a compression spring 120.

operating column 13, line 52, for "came" read cams column 15, line 7, for "end" read and column 25, line 8, for "responsibe" read responsive column 26, line 18, for "pulrality" read plurality Signed and sealed this 12th day of April 1966.

SEAL) .ttest:

Step 2: Scroll to bottom to view other similar patents

RNEST W. SWIDER EDWARD J. BRENNER ttesting Officer Commissioner of Patents

PATENT CITATIONS

Cited Patent	Filing date	Publication date	Applicant	Title
US1201809 *	Oct 14, 1913	Oct 17, 1916	Western Electric Co	Printing-telegraph receiver.
US2134722 *	Jul 31, 1935	Nov 1, 1938	Western Union Telegraph Co	Telegraph printer
US2247408 *	Mar 3, 1938	Jul 1, 1941	Teletype Corp	Printing telegraph apparatus
US2754361 *	Oct 16, 1950	Jul 10, 1956	Kleinschmidt Lab Inc	Selector mechanism
US2773931 *	Aug 15, 1951	Dec 11, 1956	Kleinschmidt Edward E	Printing telegraph apparatus
US2774816 *	Apr 27, 1953	Dec 18, 1956	Kleinschmidt Lab Inc	Printing telegraph receiver
US2942065 *	Dec 13, 1957	Jun 21, 1960	Teleprinter Corp	Telegraph printer

* Cited by examiner

REFERENCED BY

Citing Patent	Filing date	Publication date	Applicant	Title
US3291041 *	Jul 2, 1965	Dec 13, 1966	Soroban Engineering Inc	Page printer mechanism with tilting and travelling print head
US3308917 *	Feb 19, 1965	Mar 14, 1967	Siemens Ag	Type carrier positioning means employing two motors
US3310147 *	Jul 12, 1965	Mar 21, 1967	Clary Corp	Wheel striking data printer
US3326346 *	Oct 20, 1965	Jun 20, 1967	Rentaro Sasaki	Type drum printer with hammer mounted inside of and coaxial with drum
US3356198 *	May 19, 1966	Dec 5, 1967	Olivetti & Co Spa	Serial printing device having plural type heads mounted on movable carriage
US3399753 *	Jan 10, 1966	Sep 3, 1968	John E Carr	Printer with type wheel rotatable in either direction
US3417690 *	May 2, 1966	Dec 24, 1968	Scm Corp	Rolling contact printer hammer and hammer carriage
US3456078 *	Sep 20, 1965	Jul 15, 1969	Teletype Corp	Retraction type carrier mechanism
US3963109 *	Jun 9, 1975	Jun 15, 1976	Royal Business Machines, Inc.	Single element typehead positioning mechanism

* Cited by examiner

CLASSIFICATIONS

U.S. Classification	178/33.00R, 101/93.36, 178/29, 178/24, 101/93.15
International Classification	H04L17/00, H04L17/24
Cooperative Classification	H04L17/24
European Classification	H04L17/24

Google miniature bulletin printer David D

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Step 3: find prior art

Miniature bulletin printer

US 3201514 A

ABSTRACT available in

IMAGES (5)

Publication number	US3201514 A
Publication type	Grant
Publication date	Aug 17, 1965
Filing date	Oct 19, 1961
Priority date	Oct 19, 1961
Inventors	Bradbury Wilburn F, Kleinschmidt Edward E
Original Assignee	Scm Corp
Export Citation	BiBTeX, EndNote, RefMan

Patent Citations (7), Referenced by (9), Classifications (9)

External Links: USPTO, USPTO Assignment, Espacenet

DESCRIPTION (OCR text may contain errors)

CLAIMS available in

Aug. 17, 1965 E. E. KLEINSCHMIDT ETAL MINIATURE BULLETIN PRINTER SSheets-Sheet 1 Filed Oct. 19, 1961 INVENTORS Edward E. Kleinschmiclr Wilburn F Bradbury Wy 7W Attorneys Aug. 17, 1965 E. E. KLEINSCHMIDT ETAL 3,201,514

MINIATURE BULLETIN PRINTER 5 Sheets-Sheet 2 Filed Oct. 19, 1961 INVENTORS Edward E. Kleinschmidi Wilburn F Bradbury REVS 5 Sheets-Sheet 3 INVENTORS Edward E. Kle'inschmidt 7L 5 Attorneys Aug. 17, 1965 E. E. KLEINSCHMIDT ETAL MINIATURE BULLETIN PRINTER Filed Oct. 19. 1961 BY Wilburn FBrodbury Aug. 17, 1965 E. E. KLEINSCHMIDT ETAL 0 4 MINIATURE BULLETIN PRINTER Filed 001:. 19. 1961 5 Sheets-Sheet 4 Hull LLL III| INVENTORS Edward E. Kleinschmidt By Wilburn F Bradbury Attorneys United States Patent 3,201,514 MINEATURE BULLETIN PRINTER Edward E. Kleinschmidt, Miami Beach, Fla, and Wilhurn F. Bradbury, Northbroolr, IIL, assignors t0 SCM Corporation, New York, N.Y., a corporation of New York Filed Oct. 19, 1961, Ser. No. 146,105 50 Claims. (Cl. 178-33) The present invention relates to apparatus for receiving and recording coded signals and more particularly to a small compact bulletin printing apparatus exemplified in the following disclosure by what is commonly known to the telegraph industry as a printer. 7

Apparatus for receiving coded signals and automatically transforming them into recorded typographical characters for immediate reading .are well known in the art and usually consist of components such as a typewheel, print hammer and mechanism to select .a specific character .and to cause relative movement between the typewheel and print hammer, a reversible inked ribbon mechanism and a carrier and feed for the paper on which the message is printed.

In previously known equipment of this type, most of the above mentioned components are located on the front side of the

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- [x] bulletin
- [x] miniature
- [x] printer
- [ ] miniature bulletin printer

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End date: 10/19/1961

Refine search terms & locate new matches

[Telegraph **printer**](#)

www.google.com/patents/US2134722

Cited by US3201514

Grant - Filed Jul 31, 1935 - Issued Nov 1, 1938 - Long James W - Western Union Telegraph Co

TELEGRAPH **PRINTER** Filed July 51, 1935 I3 Sheets-Sheet 2 INVENTORS J.W LONG ..... Oct 19, 1961, Aug 17, 1965, Scm Corp, **Miniature bulletin printer** ...

[**Printing**-telegraph receiver.](#)

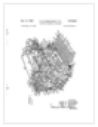
www.google.com/patents/US1201809

Cited by US3201514

Grant - Filed Oct 14, 1913 - Issued Oct 17, 1916 - Amos F Dixon - Western Electric Co

This invention relates to **printing** telegraphs, and more particularly to **printing** telegraph ..... Oct 19, 1961, Aug 17, 1965, Scm Corp, **Miniature bulletin printer** ...

[**Printing** telegraph apparatus](#)



www.google.com/patents/US2773931

Cited by US3201514

Grant - Filed Aug 15, 1951 - Issued Dec 11, 1956 - Anderson Carl P - Kleinschmidt Edward E

PRINTING TELEGRAPH APPARATUS I5 Sheets-Sheet 8 Filed Aug. 15, 1951 INVENTORS ..... Oct 19, 1961, Aug 17, 1965, Scm Corp, **Miniature bulletin printer**.

[**Printing** telegraph receiver](#)

www.google.com/patents/US2774816

Cited by US3201514

Grant - Filed Apr 27, 1953 - Issued Dec 18, 1956 - Yost Kermit D - Kleinschmidt Lab Inc

A narrow **printing** hammer, over which an inking ribbon passes, is mounted in front of the ..... Oct 19, 1961, Aug 17, 1965, Scm Corp, **Miniature bulletin printer**.

[Telegraph **printer**](#)

www.google.com/patents/US2942065

Cited by US3201514

Grant - Filed Dec 13, 1957 - Issued Jun 21, 1960 - Bernard Howard - Teleprinter Corp

The telegraph **printer** of my aforesaid Patent 2,769,029 has a type cylinder which is .... In practice, the cables 40 and 42 are **miniature** roller chains, and the pulleys 44, 46, ... Oct 19, 1961, Aug 17, 1965, Scm Corp, **Miniature bulletin printer**

Patent US3201514

Miniature bulletin printer

Show Claims

Inventors: Bradbury Wilburn F, Kleinschmidt Edward E

Assignees: Scm Corp

Patent number: US3201514

Filing date: Oct 19, 1961

Issue date: Aug 17, 1965

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Prior Art Search Overview

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Benchmarking & advancing prior in house developments

Search Terms

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- [x] portable printer
- [x] raj tuli

Custom Date Range

Start date: MM/DD/YYYY

End date: MM/DD/YYYY

Portable facsimile/thermal **printer** utilizing a multi-purpose ...

www.google.com/patents/US5420697

Grant - Filed Feb 22, 1993 - Issued May 30, 1995 - Raja S. Tuli - Tuli; Raja S.

Portable facsimile/thermal **printer** utilizing a multi-purpose single roller .... Nov 7, 1994, Sep 4, 2001, **Raja** Singh **Tuli**, Apparatus and method for facsimile design.

Receiving and sending electronic messages through a **portable** device

image not available

www.google.com/patents/WO2001060048A1?cl=en

App. - Filed Feb 8, 2001 - Published Aug 16, 2001 - Raja Tuli - Docuport Inc

A wireless, portable facsimile and printer device (1) comprising capabilities to access the Internet (4), such that electronic ... Inventors, **Raja Tuli**. Applicant ... A **portable printer** device including a modem, as claimed in Claim 1 , comprising; ...

Printer driver system for remote printing

www.google.com/patents/US20020018234

App. - Filed Mar 8, 2001 - Published Feb 14, 2002 - Arron Fu - Arron Fu

In the practice of the present invention, a universal **printer** driver is installed on the host server ... **Raja Tuli**, **Portable** internet access device back page cache.

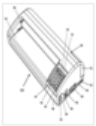
System for processing handwriting written by user of **portable** ...

www.google.com/patents/US5546538

Grant - Filed Dec 14, 1993 - Issued Aug 13, 1996 - David A. Cobbley - Intel Corporation

A **portable** computer device that relies on handwriting or speech for input is ... 2000, Mar 29, 2005, **Raja Tuli**, **Portable** high speed internet device with user fees .... **Mobile** telecommunication device having a **printer** for printing connection ...

Portable electronic faxing, scanning, copying, and printing device



www.google.com/patents/US7443547

Grant - Filed Jul 3, 2004 - Issued Oct 28, 2008 - Mario Moreno - Science Forge, Inc.

5,420,697 ("the '697 patent"), and **Tuli** U.S. Pat. ... Petteruti discloses a **portable printer** capable of printing data on either pre-cut paper or rolls of paper. ..... Nov 7 , 1994, Sep 4, 2001, **Raja** Singh **Tuli**, Apparatus and method for facsimile design.

Thermal print head arrangement

www.google.com/patents/US6154242

Grant - Filed Mar 16, 1998 - Issued Nov 28, 2000 - Raja Singh Tuli - Raja Tuli

A thermal print head arrangement for a thermal **printer** in which print lines of printing elements of ... Tuli. Original Assignee, **Raja Tuli**. Export Citation .....

In this case study the developer (Raj Tuli) holds over 100 patents including 9 for printers.

We can review his patents and other devices citing them.

Ideally we should reference those **where we are using <u>or</u> <u>improving on prior in house developments</u>**.

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Google portable printer raj tuli David D

Patents

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Portable facsimile/thermal printer utilizing a multi-purpose single roller

US 5420697 A

ABSTRACT

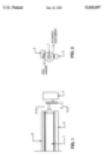
A normal size facsimile machine (81/2inches wide) is to be made for portable applications, with the added feature of being a thermal printer. The design is focused on a slim profile of extremely light weight. All components that can be attached externally only when needed, have been removed from the main body, and built as separate add on modules. Printing speeds are fast due to thermal technology and extremely economical. As far as portable facsimiles are concerned, this is quite a unique machine due to its compact size, 81/2inch wide print capability, and high speed with low power consumption.

Publication number	US5420697 A
Publication type	Grant
Application number	US 08/020,368
Publication date	May 30, 1995
Filing date	Feb 22, 1993
Priority date	Feb 22, 1993
Fee status	Lapsed

Inventors	Raja S. Tuli
Original Assignee	Tuli; Raja S.

IMAGES (1)

Step 1: find relevant methods



DESCRIPTION

BACKGROUND OF THE INVENTION

This invention relates to an apparatus and a method for producing a portable facsimile machine with a thermal printer, capable of printing on to 81/2 inch wide thermal paper. In particular, the apparatus employs a single soft durometer roller, to drive the scanner and printer mechanism simultaneously, if required. This is dependent on the mode in which the machine is in.

Conventional facsimile communication methods are utilized by the invention, as are the components. What is unique about the invention is the fact that a single

CLAIMS (2)

I claim:

1. A device capable of printing and scanning simultaneously using a single roller to accomplish both tasks such that:

the printing is accomplished through the use of the thermal print head which prints a single line of dots parallel to the roller;

the said printer prints on thermal sensitive paper which is sandwiched between the roller, which is fixed, and the said thermal print head;

<u>Step 1: find relevant methods -</u> reference **where we are using <u>or improving on prior in house developments</u>**.

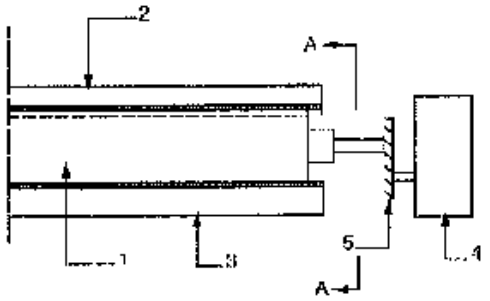


FIG. 1

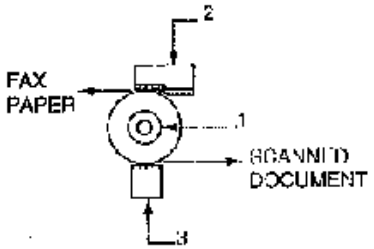


FIG. 2

<u>CLAIMS:</u>

Power consumption is reduced considerably when scanning and printing simultaneously, as only one drive roller is employed instead of two or more, in other machines of similar functions. When printing only, the contact scanner is retracted from the drive roller via a cam mechanism, so as to remove any friction resistance between the roller and scanner glass, thus reducing the torque and power requirements on the drive motor.

Size has also been reduced considerably for a machine with the described capabilities. Using the most compact configuration, in accordance with the invention, the absolute minimum dimensions were derived utilizing selected facsimile components. **Length<12.0"×width<2.5"×height<2.0".**

therebetween.

PATENT CITATIONS

Step 2: Scroll to bottom to view other similar patents

Cited Patent	Filing date	Publication date	Applicant	Title
US4583126 *	Aug 10, 1984	Apr 15, 1986	Xerox Corporation	Raster input/output scanner
US5005026 *	Mar 13, 1990	Apr 2, 1991	Sharp Kabushiki Kaisha	Thermal head separating mechanisms
US5047870 *	Mar 17, 1988	Sep 10, 1991	Optum Corporation	Image reproduction system utilizing single operation scanning/reproducing
US5077618 *	Nov 6, 1989	Dec 31, 1991	Sharp Kabushiki Kaisha	Image data processing apparatus
US5105279 *	Jul 5, 1991	Apr 14, 1992	Ricoh Company, Ltd.	Image reading and recording apparatus having a unitary read/write head
US5162916 *	Jul 2, 1990	Nov 10, 1992	Xerox Corporation	Compact read/write scanner
US5229869 *	Apr 12, 1991	Jul 20, 1993	Tokyo Electric Co., Ltd.	Portable original reading apparatus
JPH01212162A *				*Title not available*
JPS56129476A *				*Title not available*
JPS60106272A *				*Title not available*

* Cited by examiner

NON-PATENT CITATIONS

Reference		
1		"Personal Communicator" Washington Post F1,3 11/4/92.
2	*	Personal Communicator Washington Post F1,3 11/4/92.

* Cited by examiner

REFERENCED BY

Citing Patent	Filing date	Publication date	Applicant	Title
US5499108 *	Dec 9, 1992	Mar 12, 1996	Visioneer Communications, Inc.	Document-driven scanning input device communicating with a computer
US5760926 *	Oct 20, 1995	Jun 2, 1998	Apple Computer, Inc.	Apparatus for utilizing a single paper path for scanning, faxing, copying, and printing
US5867283 *	Oct 31, 1996	Feb 2, 1999	Samsung Electronics Co., Ltd.	Device and method for determining transmission/reception/duplication positions in facsimile system
US6285469 *	Nov 7, 1994	Sep 4, 2001	Raja Singh Tuli	Apparatus and method for facsimile design
US7248376 *	Sep 19, 2005	Jul 24, 2007	Silverbrook Research Pty Ltd	Printer module with a pen-like configuration
			Science Forge,	

Google portable printer raj tuli David D

Patents

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Step 3: find prior art

Portable facsimile/thermal printer utilizing a multi-purpose single roller

US 5420697 A

Publication number	US5420697 A
Publication type	Grant
Application number	US 08/020,368
Publication date	May 30, 1995
Filing date	Feb 22, 1993
Priority date	Feb 22, 1993
Fee status	Lapsed
Inventors	Raja S. Tuli
Original Assignee	Tuli; Raja S.
Export Citation	BiBTeX, EndNote, RefMan

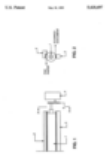
Patent Citations (10), Non-Patent Citations (2), Referenced by (57), Classifications (7), Legal Events (11)

External Links: USPTO, USPTO Assignment, Espacenet

ABSTRACT

A normal size facsimile machine (81/2inches wide) is to be made for portable applications, with the added feature of being a thermal printer. The design is focused on a slim profile of extremely light weight. All components that can be attached externally only when needed, have been removed from the main body, and built as separate add on modules. Printing speeds are fast due to thermal technology and extremely economical. As far as portable facsimiles are concerned, this is quite a unique machine due to its compact size, 81/2inch wide print capability, and high speed with low power consumption.

IMAGES (1)



DESCRIPTION

BACKGROUND OF THE INVENTION

This invention relates to an apparatus and a method for producing a portable facsimile machine with a thermal printer, capable of printing on to 81/2 inch wide thermal paper. In particular, the apparatus employs a single soft durometer roller, to drive the scanner and printer mechanism simultaneously, if required. This is dependent on the mode in which the machine is in.

Conventional facsimile communication methods are utilized by the invention, as are the components. What is unique about the invention is the fact that a single

CLAIMS (2)

I claim:

1. A device capable of printing and scanning simultaneously using a single roller to accomplish both tasks such that:

the printing is accomplished through the use of the thermal print head which prints a single line of dots parallel to the roller;

the said printer prints on thermal sensitive paper which is sandwiched between the roller, which is fixed, and the said thermal print head;

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Refine search terms & locate new matches

I• IKITAKE, Z. A **miniature** earth-inductor. Bull. Earthquake Res. Inst., Tokyo Univ., 29, Pt• 1
WC PARKINSON, FW WOOD, WE SCOTT - Trans. Amer. Geophys. Union, 1951
... Observatorio del Ebro, No. 10, 119 (1949). I•IKITAKE, Z. A **miniature** earth-inductor. Bull. ... Govt. **Printer**, Pretoria, 58 pp. with appendix (1950). ... U•]) S•_T]•s Co,_sT •_N•) G]•o•)]•½ SURVEY. Seismological **bulletin**, January, February, March, 1949. Washington, I). C., US Coast Geod. ...

A Philadelphia Calico-**Printer**
NA Reath - The Pennsylvania Museum **Bulletin**, 1931
... in the **Bulletin** for March 1930. ... John Hewson was an English calico-**printer**, born in 1744, and employed at Bromley Hall, near London, "one of the most ... Mrs. Alcock tells us that when Mrs. Washington found Hewson needed a likeness to copy she lent him a **miniature**, from which ...

Bulletin: Anthropological series
National Museum of Canada - 1953

A Sienese Antiphonary
MEG - **Bulletin** of the Fogg Art Museum, 1932

John Shand Gordon Correspondence
JS Gordon, HE Dunnack - 1872
... I enolese a shert stery ef myself fer "Literary **Bulletin**." will yeu ... ' ' " OSS*® ' ®jS3>» JOHN GORDON., Proprietor Author of "The Sea Serpent," "The Tramp **Printer**," "Sandy McWhiffle, Famous Inventor," and "Gordon's **Miniature** Library." Also "The Vinalhaven Pilot." ...

Ming printing and **printers**
KT Wu, W Kuang-Ch'ing - Harvard Journal of Asiatic Studies, 1943
... As makers of ink, the CH'ENG brothers were very skillful in embossing the familiar delicate designs and **miniature** pictures on ... due to typesetting are reduced to a minimum, inasmuch as the block is carved directly from the " **printer's** copy "; and ... MING PRINTING AND **PRINTERS** ...

Telegraph **printer**

www.google.com/patents/US2134722
Cited by US3201514
Grant - Filed Jul 31, 1935 - Issued Nov 1, 1938 - Long James W - Western Union Telegraph Co
TELEGRAPH **PRINTER** Filed July 51, 1935 I3 Sheets-Sheet 2 INVENTORS J.W LONG ..... Oct 19, 1961, Aug 17, 1965, Scm Corp, **Miniature bulletin printer** ...

Printing-telegraph receiver.

Patent US3201514

Miniature bulletin printer

Show Claims

Inventors: Bradbury Wilburn F, Kleinschmidt Edward E
Assignees: Scm Corp
Patent number: US3201514
Filing date: Oct 19, 1961
Issue date: Aug 17, 1965

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Telegraph **printer**

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Grant - Filed Jul 31, 1935 - Issued Nov 1, 1938 - Long James W - Western Union Telegraph Co

TELEGRAPH **PRINTER** Filed July 51, 1935 I3 Sheets-Sheet 2 INVENTORS J.W LONG ..... Oct 19, 1961, Aug 17, 1965, Scm Corp, **Miniature bulletin printer** ...

Printing-telegraph receiver.

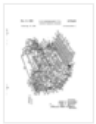
www.google.com/patents/US1201809

Cited by US3201514

Grant - Filed Oct 14, 1913 - Issued Oct 17, 1916 - Amos F Dixon - Western Electric Co

This invention relates to **printing** telegraphs, and more particularly to **printing** telegraph ..... Oct 19, 1961, Aug 17, 1965, Scm Corp, **Miniature bulletin printer** ...

Printing telegraph apparatus



www.google.com/patents/US2773931

Cited by US3201514

Grant - Filed Aug 15, 1951 - Issued Dec 11, 1956 - Anderson Carl P - Kleinschmidt Edward E

PRINTING TELEGRAPH APPARATUS I5 Sheets-Sheet 8 Filed Aug. 15, 1951 INVENTORS ..... Oct 19, 1961, Aug 17, 1965, Scm Corp, **Miniature bulletin printer**.

Printing telegraph receiver

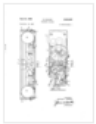
www.google.com/patents/US2774816

Cited by US3201514

Grant - Filed Apr 27, 1953 - Issued Dec 18, 1956 - Yost Kermit D - Kleinschmidt Lab Inc

A narrow **printing** hammer, over which an inking ribbon passes, is mounted in front of the ..... Oct 19, 1961, Aug 17, 1965, Scm Corp, **Miniature bulletin printer**.

Telegraph **printer**



www.google.com/patents/US2942065

Cited by US3201514

Grant - Filed Dec 13, 1957 - Issued Jun 21, 1960 - Bernard Howard - Teleprinter Corp

The telegraph **printer** of my aforesaid Patent 2,769,029 has a type cylinder which is .... In practice, the cables 40 and 42 are **miniature** roller chains, and the pulleys 44, 46, ... Oct 19, 1961, Aug 17, 1965, Scm Corp, **Miniature bulletin printer**

Patent US3201514

Miniature bulletin printer

Show Claims

Inventors: Bradbury Wilburn F, Kleinschmidt Edward E

Assignees: Scm Corp

Patent number: US3201514

Filing date: Oct 19, 1961

Issue date: Aug 17, 1965

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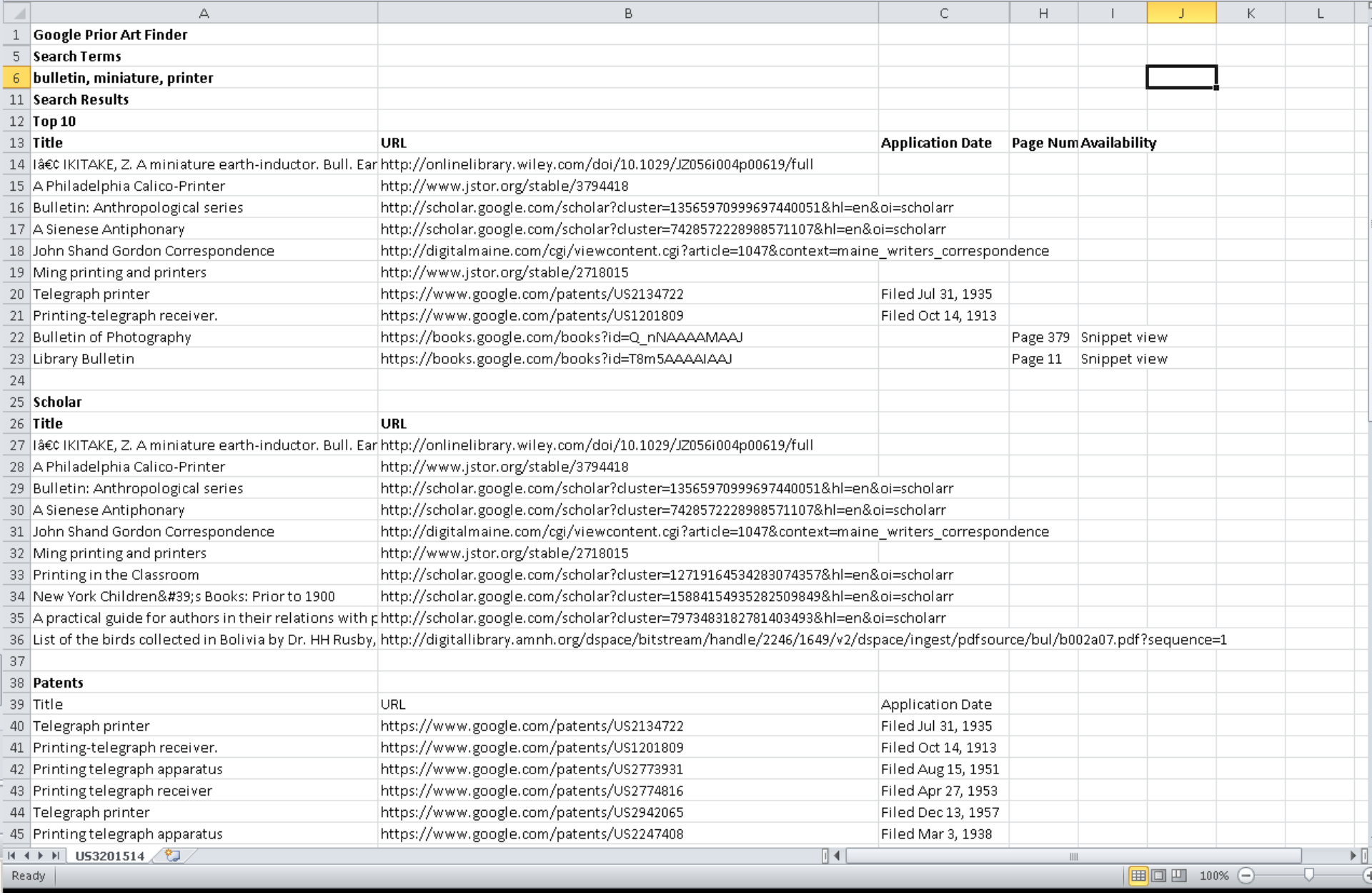

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14	Iâ€¢ IKITAKE, Z. A miniature earth-inductor. Bull. Ear	http://onlinelibrary.wiley.com/doi/10.1029/JZ056i004p00619/full						
15	A Philadelphia Calico-Printer	http://www.jstor.org/stable/3794418						
16	Bulletin: Anthropological series	http://scholar.google.com/scholar?cluster=13565970999697440051&hl=en&oi=scholarr						
17	A Sienese Antiphonary	http://scholar.google.com/scholar?cluster=7428572228988571107&hl=en&oi=scholarr						
18	John Shand Gordon Correspondence	http://digitalmaine.com/cgi/viewcontent.cgi?article=1047&context=maine_writers_correspondence						
19	Ming printing and printers	http://www.jstor.org/stable/2718015						
20	Telegraph printer	https://www.google.com/patents/US2134722	Filed Jul 31, 1935					
21	Printing-telegraph receiver.	https://www.google.com/patents/US1201809	Filed Oct 14, 1913					
22	Bulletin of Photography	https://books.google.com/books?id=Q_nNAAAAMAAJ		Page 379	Snippet view			
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26	**Title**	**URL**						
27	Iâ€¢ IKITAKE, Z. A miniature earth-inductor. Bull. Ear	http://onlinelibrary.wiley.com/doi/10.1029/JZ056i004p00619/full						
28	A Philadelphia Calico-Printer	http://www.jstor.org/stable/3794418						
29	Bulletin: Anthropological series	http://scholar.google.com/scholar?cluster=13565970999697440051&hl=en&oi=scholarr						
30	A Sienese Antiphonary	http://scholar.google.com/scholar?cluster=7428572228988571107&hl=en&oi=scholarr						
31	John Shand Gordon Correspondence	http://digitalmaine.com/cgi/viewcontent.cgi?article=1047&context=maine_writers_correspondence						
32	Ming printing and printers	http://www.jstor.org/stable/2718015						
33	Printing in the Classroom	http://scholar.google.com/scholar?cluster=12719164534283074357&hl=en&oi=scholarr						
34	New York Children's Books: Prior to 1900	http://scholar.google.com/scholar?cluster=15884154935282509849&hl=en&oi=scholarr						
35	A practical guide for authors in their relations with p	http://scholar.google.com/scholar?cluster=7973483182781403493&hl=en&oi=scholarr						
36	List of the birds collected in Bolivia by Dr. HH Rusby,	http://digitallibrary.amnh.org/dspace/bitstream/handle/2246/1649/v2/dspace/ingest/pdfsource/bul/b002a07.pdf?sequence=1						
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38	**Patents**							
39	Title	URL	Application Date					
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41	Printing-telegraph receiver.	https://www.google.com/patents/US1201809	Filed Oct 14, 1913					
42	Printing telegraph apparatus	https://www.google.com/patents/US2773931	Filed Aug 15, 1951					
43	Printing telegraph receiver	https://www.google.com/patents/US2774816	Filed Apr 27, 1953					
44	Telegraph printer	https://www.google.com/patents/US2942065	Filed Dec 13, 1957					
45	Printing telegraph apparatus	https://www.google.com/patents/US2247408	Filed Mar 3, 1938					

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- 1403 - Webcrawler development -TAX CASE (Highweb
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Overview Run PAST Prior Art

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Benchmark Method/Source	Measurement	uploaded	Explanatory notes
Internet searches	100 Articles	1	Before testing each hypothesis, Mr. Tuli stated that they looked at the current state of the art to see what was being done worldwide. Mr. Tuli stated that there was no published information with respect to a miniature printer with so many embedded technologies.
Patent searches	14 patents	2	The attached patents illustrate how they can be analysed with respect to each of the issues of technological uncertainty.
Competitive products or processes	5 products		We examined the methods used in several competitive products
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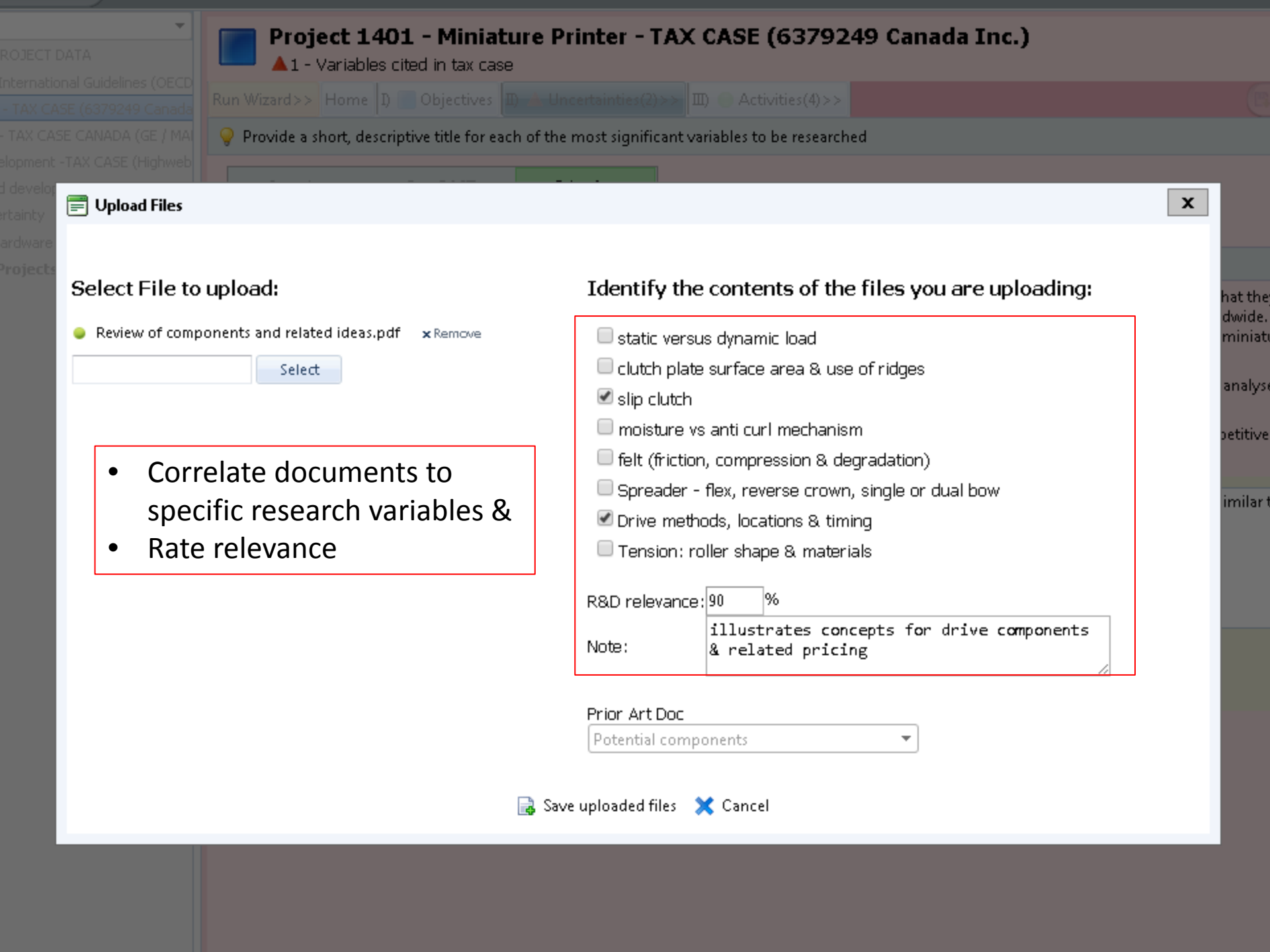
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clutch plate surface area & use of ridges
slip clutch
moisture vs anti curl mechanism
felt (friction, compression & degradation)
Spreader - flex, reverse crown, single or dual bow
Drive methods, locations & timing
Tension: roller shape & materials
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2.	clutch plate surface area & use of ridges	1 edit	2, 4
3.	slip clutch	2 Hide documents list GooglePriorArtFinder Printer Design.csv Review of components and related ideas.pdf	
4.	moisture vs anti curl mechanism		
5.	felt (friction, compression & degradation)	1 edit	

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PROBLEMS: Mr. Tuli stated that when he first investigated what had gone wrong with the printer, it was clear that two technological uncertainties still existed. The first one was that the paper did not come out flat from the printer and the second was that the battery died out too rapidly. After printing many pages, they observed that the felt on the slip clutch was degrading more rapidly than had been anticipated. They also observed that the motor stalled prematurely with further issues regarding dynamic and static friction to resolve.

HYPOTHESES: It was hypothesized that there could be external factors that had an effect on the paper curling after extended periods of time on the paper reel. It was further hypothesized that humidity could significantly contribute to the changes in the characteristics of the paper over time. A jig (moisture chamber) was developed to test the paper moisture content.

Mr. Tuli wanted to see if the moisture content could cause the paper to degrade and prevent the anti-curl mechanism from working. Since the paper was curled in a tight roll, it was hard to simulate the real environment with a jig. Mr. Tuli stated that they were not able to apply the moisture to the paper evenly. Mr. Tuli stated that they tried many techniques but they were not able to apply the moisture evenly on each page of the roll of paper. Research was done in order to find literature that could assist the appellant but nothing was found. At that point, they thought another solution would be to render the anti-curl mechanism in the printer even stronger.

TEAM CAN ACCESS THESE DOCUMENTS WHEN DESIGNING EXPERIMENTS