

AUSTRALIA
Patents Act

604941

APPLICATION FOR A STANDARD PATENT

/We Heidelberger Druckmaschinen Aktiengesellschaft

of Alte Eppelheimer Strasse 17-21,,
D-6900 Heidelberg,
FEDERAL REPUBLIC OF GERMANY.

hereby apply for the grant of a standard patent for an invention
entitled:

DEVICE FOR MEASURING PAPER OR THE LIKE LYING ON A TABLE

which is described in the accompanying complete specification.

Address for Service:

PHILLIPS ORMONDE & FITZPATRICK
Patent and Trade Mark Attorneys
367 Collins Street
Melbourne 3000 AUSTRALIA

Dated: 11 July 1988

MOO1 PHILLIPS ORMONDE & FITZPATRICK
Attorneys for:
Heidelberger Druckmaschinen Aktiengesellschaft

By:

Our Ref : 99721
POF Code: 1386/1386

APPLICATION ACCEPTED AND AMENDMENTS

ALLOWED 5.10.90

6012q/1

COMMONWEALTH OF AUSTRALIA

Patents Act

DECLARATION FOR A PATENT APPLICATION

INSTRUCTIONS

- (a) Insert "Convention" if applicable
- (b) Insert FULL name(s) of applicant(s)

In support of the (a)
(b)

application made by

HEIDELBERGER DRUCKMASCHINEN AKTIENGESELLSCHAFT

- (c) Insert "of addition"
if applicable
- (d) Insert TITLE of
invention

(hereinafter called "applicant(s)" for a patent (c)
invention entitled (d)

for an

"DEVICE FOR MEASURING PAPER OR THE LIKE LYING ON A
TABLE"

- (c) Insert FULL name(s)
AND address(es) of
declarant(s)
(See headnote*)

xx We (*) Mr. Pfizenmaier Director and Mr. Stoltenberg Head of the
Patent Department of Heidelberger Druckmaschinen Aktiengesellschaft
of Kurfursten-Anlage 52-60, D-6900 Heidelberg
Federal Republic of Germany

do solemnly and sincerely declare as follows:

1. XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

(or, in the case of an application by a body corporate)

1. ~~XXXXXX~~ We are authorized to make this declaration on behalf of the applicant ☒.

2. ~~XXXXXX We are the actual inventors of the greenoox~~

(or, where the applicant(s) is/are not the actual inventor(s))

- (f) Insert FULL name(s)
AND address(es) of
actual inventor(s)

2. (f) Dr. Nikolaus Spiegel: Dantestrass 13, 6909, Walldorf
Federal Republic of Germany and Karlheinz Krestyn: Paul-Lincke-
Weg 2, 6906 Leimen 3 Federal Republic of Germany and Peter
Theobald Blaser, Neuwiesenweg 3, 6912 Dielheim, Federal Republic
of Germany

- (g) Recite how applicant(s) derive(s) title from actual inventor(s)
(See headnote**)

~~is/are~~ the actual inventor(s) of the invention and the facts upon which the applicant(s) is/~~are~~ entitled to make the application are as follows:

(g.)

Applicant is the assignee of the inventors.

- (h) Insert country, filing date, and basic applicant(s) for the/or EACH basic application

(Note: Paragraphs 3 and 4 apply only to Convention applications)

3. ~~The basic application(s) for patent or similar protection on which the application is based is/are identified by **country, filing date, and basic applicant(s)** as follows:~~

(b)

- (k) Insert **PLACE** of signing

- (1) Insert DATE of signing

- (m) Signature(s) of declarant(s)

Note: No legalization or other witness required

Declared at (k) 6900 Heidelberg

Dated (1) June 23, 1988

Heidelberger Druckmaschinen

(m) **Aktiengesellschaft**

To: The Commissioner of Patents

Pfizenmaier

Stoltenberg

(12) PATENT ABRIDGMENT (11) Document No. AU-B-19003/88
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 604941

- (54) Title
DEVICE FOR MEASURING PAPER OR THE LIKE LYING ON A TABLE
- International Patent Classification(s)
(51)⁴ G01B 007/10
- (21) Application No. : 19003/88 (22) Application Date : 13.07.88
- (43) Publication Date : 18.01.90
- (44) Publication Date of Accepted Application : 03.01.91
- (71) Applicant(s)
HEIDELBERGER DRUCKMASCHINEN AKTIENGESELLSCHAFT
- (72) Inventor(s)
Dr. NIKOLAUS SPIEGEL; KARLHEINZ KRESTYN; PETER THEOBALD BLASER
- (74) Attorney or Agent
PHILLIPS ORMONDE & FITZPATRICK, 367 Collins Street, MELBOURNE VIC 3000
- (56) Prior Art Documents
EP 96742
US 4136454
GB 1506232
- (57) In the paper working industry, especially in the printing industry, it is of interest to measure the paper, e.g. a sheet, to be worked on for receiving information therefrom as to the required machine setting values. Since every sheet can have different thickness values, it is necessary to measure each sheet individually after it was taken from the sheet stack and has arrived in the sheet alignment area.

CLAIM

1. A device for measuring the thickness of paper lying on a support by engaging the sheet at only one location, the device having a pull guide arranged above the paper including a pivot bearing with a lever formed of two arms rigidly mounted thereon, and a pull roller located at an end of one arm of the lever and engageable at the one location with the surface of a sheet of the paper arriving on the support, the pull guide also including distance measuring means located at the end of the other arm of the lever for measuring a movement executed by the lever for issuing a signal in proportion with the magnitude of the distance traversed by said movement, and means connected to said distance measuring means for electronically evaluating said signal.

(11) AU-B-19003/88
(10) 604941

-2-

4. Method of measuring the thickness of paper lying on a support while engaging the sheet at only one location by means of a device according to claim 1 or 2 which includes defining the position of the lever formed of the two rigidly mounted arms, before measurement, as starting position for succeeding measurements.

Patents Act

604941

Application Number:
Lodged:

Class

Int. Class

Complete Specification Lodged:

Accepted:

Published:

Priority

Related Art:

This document contains the amendments made under Section 49 and is correct for printing.

APPLICANT'S REFERENCE: A-514

Name(s) of Applicant(s):

Heidelberger Druckmaschinen Aktiengesellschaft

Address(es) of Applicant(s):

Alte Eppelheimer Strasse 17-21,,
D-6900 Heidelberg,
FEDERAL REPUBLIC OF GERMANY.

Address for Service is:

PHILLIPS ORMONDE & FITZPATRICK
Patent and Trade Mark Attorneys
367 Collins Street
Melbourne 3000 AUSTRALIA

Complete Specification for the invention entitled:

DEVICE FOR MEASURING PAPER OR THE LIKE LYING ON A TABLE

Our Ref : 99721
POF Code: 1386/1386

The following statement is a full description of this invention, including the best method of performing it known to applicant(s):

The invention relates to a device for measuring paper or the like lying on a table, said device consisting of a pull guide arranged above the paper which has a lever, mounted on a fulcrum, at the end region of said lever being arranged a pull roller which touches the surface of the arrived sheet.

In the paper working industry, especially in the printing industry, it is of interest to measure the paper, e.g. a sheet, to be worked on for receiving information therefrom as to the required machine setting values. Since every sheet can have different thickness values, it is necessary to measure each sheet individually after it was taken from the sheet stack and has arrived in the sheet alignment area.

With known devices of the above mentioned kind, as known e.g. from the German Patent Application Nr. 32 21 379, there is a pivotal lever arm positioned above the sheet alignment table and out of the effective range of the side pull guide, with a roller being provided at the end of said lever arm and touching the paper surface. A change in sheet thickness causes a vertical movement of the lever arm which is sensed by a measuring device directly connected to the lever arm.

It is disadvantageous that by this measuring method a further direct contact with the sheet to be measured must be made. With this direct contact there does exist an additional possibility of damage to the paper surface. In general, it is aimed at avoiding as much as possible any mechanical influences on the printing sheet.

Therefore, it is the object of the invention to create a device of the kind as defined above, whereby the possibility of damage to the paper surface is diminished.

~~With this in mind, the present invention provides in one aspect a device for measuring paper or the like lying on a table, said device comprising a pull guide arranged above the paper and having a lever mounted on a fulcrum, a pull roller which touches the arrived sheet on its surface being arranged at the end of said lever, wherein the pull guide is provided with a distance indicator which measures a vertical movement executed by the lever, and wherein the valve determined by the~~



With this in mind, the present invention provides in one aspect a device for measuring the thickness of paper lying on a support by engaging the sheet at only one location, the device having a pull guide arranged above the paper including a pivot bearing with a lever formed of two arms rigidly mounted thereon, and a pull roller located at an end of one arm of the lever and engageable at the one location with the surface of a sheet of the paper arriving on the support, the pull guide also including distance measuring means located at the end of the other arm of the lever for measuring a movement executed by the lever for issuing a signal in proportion with the magnitude of the distance traversed by said movement, and means connected to said distance measuring means for electronically evaluating said signal.

According to another aspect of the present invention there is provided a method for measuring the thickness of paper lying on a support while engaging the sheet at only one location by means of the device described above which includes defining the position of the lever formed of the two rigidly mounted arms, before measurement, as starting position for succeeding measurements.

According to a further aspect of the present invention, there is provided a method for measuring the thickness of paper lying on a support while engaging the sheet at only one location by means of the device described above which includes performing at least one of the steps of issuing a warning signal and stopping the machine when a given tolerance range of sheet thickness is exceeded.

According to yet another aspect of the present invention, there is provided a method for measuring the thickness of paper lying on a support while engaging the sheet at only one location by means of the device described above which includes performing at least one of the steps of signalling the presence of multiple sheets and stopping the machine when sheet thickness measurements indicate the presence of an integral multiplicity of given sheet thicknesses.



~~distance indicator is transmitted to an electronic evaluation facility.~~

According to another aspect of the present invention there is provided a method for measuring paper lying on a table by means of ~~the device described above.~~

The advantage of this invention is to be seen in that the paper thickness measurement is integrated in the existing pull guide. By this arrangement the pull roller, besides its original function of pressing down the paper, has an additional function, namely the raising or lowering of the pivotally mounted lever and, resulting therefrom, the sensing of the paper thickness. Therefore, the conventional device for measuring the paper thickness, which has been used up to now and which functions independently of the pull guide, can be entirely neglected. Besides saving costs for material and assembly, a critical point with regard to the possibility of damage to the sheet surface will be completely eliminated. Furthermore, the pivotally mounted lever permits measuring of the most variable printing materials, since the lever touching the paper surface via the pull roller adjusts itself automatically to the thicknesses of the various printing materials.

A further preferred embodiment of the invention is characterized in that the lever is designed as a two-arm lever, in that at the side opposite the pull roller the lever is provided with a measuring surface which is shaped like a tongue and is arranged parallel to the paper feed table, and in that an inductive distance indicator is arranged at the pull guide above the measuring surface with its effectiveness being directed towards the measuring surface.

This embodiment of the invention permits the use of an inductive distance transmitter with which an exact resolution of the measuring range is attainable.

Further preferred embodiments of the invention permit a certain lever position to be defined as the starting position for any following measurements in that, at the start of a production run and before the first sheet has arrived for measurement, the present lever position is



defined as the starting position for measurement of the sheet thickness. A manual adjustment of the lever to the different sheet thickness can thereby be eliminated. When a certain tolerance range of paper thickness is exceeded, e.g. with the arrival of a double or multiple sheet, the electronic evaluation facility can give a control instruction for appropriate reaction.

Double or multiple sheets are instantly recongnized and indicated by the electronic evaluation facility on account of the multiple measurement of the expected statistical sheet thickness.

The following description refers in more detail to the various features of the device of the present invention. To facilitate an understanding of the invention, reference is made in the description to the accompanying drawings where the device is illustrated in a preferred embodiment. It is to be understood that the device of the present invention is not limited to the preferred embodiment as illustrated in the drawings.

Fig. 1 shows a side view of the device,

Fig. 2 shows a top view of the device.

The device consists of a basic body 4 which is displaceably arranged on a traverse 3 extending above the feed table 1. For fastening the basic body 4 on the traverse 3 there is provided a locking screw 5. At the side facing the feed table 1 the basic body 4 shows a pivot bearing 8 which serves to receive a two-arm lever 9 extending parallel to the traverse 3. One arm of the two-arm lever 9 extends away from the basic body 4 and is bent towards the feed table 1 at the pivot bearing 8. At its end this arm of the two-arm lever 9 is also provided with a pull roller 7 which touches the surface of a sheet 2 that has arrived on the feed table 1. At the end of this arm of the two-arm lever 9 there is provided a stop pin 6 which aligns the arrived sheet 2. That arm of the two-arm lever 9 which is directed towards the basic body 4 is provided at its end with a tongue 11 designed as a measuring surface which extends parallel to the surface of the feed table 1 and parallel to the base of the basic body 4. At a right angle to the tongue 11 there is a distance indicator 10 inserted into the basic body 4 in such

a way that the effective range of the distance indicator 10 is directed onto the tongue 11. Between the tongue 11 and the distance indicator end 13 provided with the effective range there exists a narrow slit 12.

A sheet 2 arriving on the feed table 1 is conveyed to the side alignment device; in order not to impair the side alignment of the sheet 2, that arm of the two-arm lever 9 which is connected with the pull roller 7 is raised during the side alignment, whereby a turning movement about the fulcrum of the pivot bearing 8 takes place. This turning movement about the pivot bearing 8 simultaneously causes a lowering of that arm of the two-arm lever 9 which is provided with the tongue 11. The inductive distance indicator 10 inserted in the basic body 4 senses the degree of lowering i.e. the degree of widening of the slit 12 that exists between the tongue 11 and the effective range of the inductive distance indicator 10. The value determined by the distance indicator 10 is transmitted to a conventional microcomputer (not illustrated) for evaluation. If this value is not within the tolerance range, a stop of the machine and/or a warning signal is the result.

Before the first sheet 2 arrives the position of the lever 9 is sensed by the distance indicator 10 and transmitted to the microcomputer (not illustrated). The transmitted measuring value is defined by the microcomputer as a reference value for the following measurements. With the simultaneous arrival of a plurality of sheets 2 the slit 12 widens in proportion to the measure resulting from the plurality of sheets 2, so that the microcomputer issues a signal for recognition of multiple sheets.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

10
1. A device for measuring the thickness of paper lying on a support by engaging the sheet at only one location, the device having a pull guide arranged above the paper including a pivot bearing with a lever formed of two arms rigidly mounted thereon, and a pull roller located at an end of one arm of the lever and engageable at the one location with the surface of a sheet of the paper arriving on the support, the pull guide also including distance measuring means located at the end of the other arm of the lever for measuring a movement executed by the lever for issuing a signal in proportion with the magnitude of the distance traversed by said movement, and means connected to said distance measuring means for electronically evaluating said signal.

20
2. Device according to claim 1, wherein the one arm of the two-armed lever at which the pull roller is located is formed with a tongue disposed parallel to the support, said distance measuring means being an inductive distance measuring device arranged on the pull guide above the tongue and being operatively effective in a direction towards the tongue.

3. Device substantially as hereinbefore described with respect to what is shown in the accompanying drawings.

30
4. Method of measuring the thickness of paper lying on a support while engaging the sheet at only one location by means of a device according to claim 1 or 2 which includes defining the position of the lever formed of the two rigidly mounted arms, before measurement, as starting position for succeeding measurements.

5. Method of measuring the thickness of paper lying on a support while engaging the sheet at only one location by means of a device according to claims 1 or 2 which includes performing at least one of the steps of issuing a warning signal and stopping the machine when a given tolerance range of sheet thickness is exceeded.

6. Method of measuring the thickness of paper lying on a support while engaging the sheet at only one location by means of a device according to claim 1 or 2



which includes performing at least one of the steps of signalling the presence of multiple sheets and stopping the machine when sheet thickness measurements indicate the presence of an integral multiplicity of given sheet thicknesses.

7. Method substantially as hereinbefore described with respect to what is shown in the accompanying drawings.

10

DATED: 29 August 1990

PHILLIPS ORMONDE & FITZPATRICK

Attorneys for:

HEIDELBERGER DRUCKMASCHINEN AKTIENGESELLSCHAFT

David B Fitzpatrick

30



VHF 0969b

Fig. 1

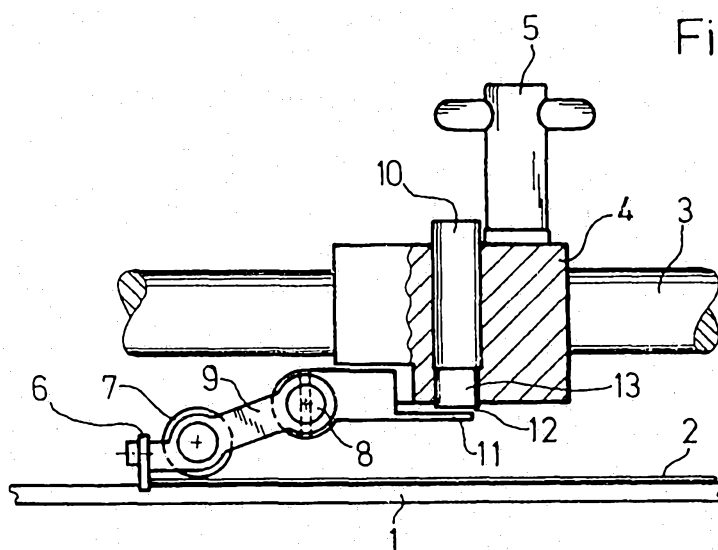


Fig. 2

