

CONVENTION APPLICATION FOR A PATENT

(1) Here insert (in full) Name of Applicant or Applicants, followed by Address (es).

X (1) We SOCIETE D'APPLICATIONS GENERALES D'ELECTRICITE ET DE
MECANIQUE SAGEM

6 Avenue d'Iena

75783 Paris Cedex 16

France

(2) Here insert Title of Invention.

hereby apply for the grant of a Patent for an invention entitled: (2)

PRINTING MACHINE ADAPTED FOR REDUCTION OF ITS OPERATING NOISE

LEVEL

(3) Here insert number(s) of basic application(s)

which is described in the accompanying complete specification. This application is a

Convention application and is based on the application numbered (3)

87 09550

(4) Here insert Name of basic Country or Countries, and basic date or dates

for a patent or similar protection made in (4)

on the 6th day of July, 1987

APPLICATION ACCEPTED AND AMENDMENTS

ALLOWED

14 - 9 - 90

10000905

06/07/88 address for service is Messrs. Edwd. Waters & Sons, Patent Attorneys,
50 Queen Street, Melbourne, Victoria, Australia.

DATED this 5th day of July 1988

SOCIETE D'APPLICATIONS GENERALES
ET DE MECANIQUE SAGEM

(5) Signature (s) of Applicant (s) or Seal of Company and Signatures of its Officers as prescribed by its Articles of Association.

(5)

L. J. DYSON

Registered Patent Attorney

To:

THE COMMISSIONER OF PATENTS.

(CONVENTION. Company.)

Form 8

COMMONWEALTH OF AUSTRALIA

Patents Act 1952-1962

DECLARATION IN SUPPORT OF A CONVENTION
APPLICATION FOR A PATENT OR PATENT OF ADDITION

(1) Here
insert (in
full) Name of
Company.

In support of the Convention Application made by⁽¹⁾
SOCIETE D'APPLICATIONS GENERALES D'ELECTRICITE ET DE
MECANIQUE SAGEM

(hereinafter referred to as the applicant) for a Patent

(2) Here
insert title
of Invention.

for an invention entitled:⁽²⁾
PRINTING MACHINE ADAPTED FOR REDUCTION OF ITS OPERATING
NOISE LEVEL

(3) Here
insert full Name
and Address
of Company
official
authorized
to make
declaration.

I,⁽³⁾ JEAN GOULIARDON
of 6 avenue d'Iena, 75783 Paris Cedex 16, France

do solemnly and sincerely declare as follows:

1. I am authorised by the applicant for the patent
to make this declaration on its behalf.

(4) Here
insert basic
Country or
Countries
followed by
date or dates
and have
Applicant or
Applicants.

2. The basic application as defined by Section 141 of the Act was
made in⁽⁴⁾ France
on the 6th day of July 1987 by
SOCIETE D'APPLICATIONS GENERALES D'ELECTRICITE ET DE
MECANIQUE SAGEM

(5) Here
insert (in
full) Name
and Address
of Actual
Inventor or
Inventors.

3. (5) GUY CHEVROLLIER, 16 Rue de l'Isle, 95740
Frepillon, OLIVIER DARDENNE, 1 Rue du marche Neuf,
95000 Cergy and JEAN MICHEL CICCONE, 53 Rue
des Voltigeurs, 95520 Osny, France

~~By~~ are the actual inventor of the invention and the facts upon which the applicant
is entitled to make the application are as follow:

The applicant is the assignee of the said actual inventors

4. The basic application referred to in paragraph 2 of this Declaration
was the first application made in a Convention country in
respect of the invention the subject of the application.

DECLARED at Paris, France
this 30th day of June 1988

(6) Signature.

To: THE COMMISSIONER OF PATENTS.

Edwd. Waters & Sons,
Melbourne.

(6)

Jean GOULIARDON
Directeur Technique

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(12) PATENT ABRIDGMENT (11) Document No. AU-B-18765/88
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(54) Title
PRINTING MACHINE ADAPTED FOR REDUCTION OF ITS OPERATING NOISE LEVEL

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3122

(57) Claim

1. Printing assembly which is adapted for printing on
a print medium in a form of a sheet or tape comprising:

a printing cylinder on which is wound and urged said
print medium during a printing operation;

printing means to print on said print medium and to urge
it against the printing cylinder;

advance means upstream of said printing means to advance
said print medium;

tensioning means downstream of said printing means for
tightening the print medium against said printing
cylinder, comprising:

two contra-rotating rollers having substantially
smooth outer surfaces in contact from opposite
sides of said print medium, allowing sliding at
said contacting surfaces and providing for
tensioning of the print medium on said print
cylinder;

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(10) 604134

-2-

said rollers being of the same diameter and both motor-powered and driven at the same rotational velocity, said rotational velocity being greater than the advance velocity of said advance means;

and means for pulling said rollers elastically towards each other with substantially constant and identical forces,

respectively.

COMMONWEALTH OF AUSTRALIA

Form 10

PATENTS ACT 1952-69

COMPLETE SPECIFICATION

(ORIGINAL)

60 4 134

Class

Int. Class

Application Number:
Lodged:

Complete Specification Lodged:

Accepted:

Published:

Priority:

Related Art:

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

Name of Applicant: SOCIETE D'APPLICATIONS GENERALES D'ELECTRICITE ET DE MECANIQUE
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Complete Specification for the invention entitled: PRINTING MACHINE ADAPTED FOR REDUCED NOISE LEVEL
OPERATING NOISE LEVEL

The following statement is a full description of this invention, including the best method of performing it known to the inventor: US

PRINTING MACHINE ADAPTED FOR REDUCTION OF ITS OPERATING NOISE LEVEL

5 BACKGROUND OF THE INVENTION

The present invention relates to improvements in or to printing machines adapted to print a print support in sheet or in strip form in order to reduce the noise level in the course of their operation, and
10 whatever the type of print support used.

As shown in Figure 1 of the accompanying drawing (in which are shown very diagrammatically only the members of a printing machine directly concerned within the scope of the invention), a printing machine
15 of the type envisaged by the invention comprises, particularly, a printing cylinder 1 on which is wound a sheet or print support strip 2. The advance (arrow 3) of this sheet or strip is caused by the rotation of a drive roller 4 driven by motor means (not shown) and
20 urging the sheet or strip against the cylinder 1, forming a capstan ; the drive roller 4 is situated upstream (in the direction of advance of the sheet or strip 2) of the printing means (shown diagrammatically by the arrow 5).

25 An important noise source in the course of the operation of such a printing machine is situated in the printing region of the print support. In fact, the sheet or print support strip 2, conducted opposite the print means 5, mates badly with the contour of the
30 printing roller 1 and is not perfectly applied against the surface of the latter, in spite of the presence of lateral guides (not shown). Through this fact, there

subsists between the sheet or strip 2 and the surface of the cylinder 1, a wedge of air 6. When the printing means 5 (hammers or needles, for example) are thrown onto the surface of the sheet or the print support strip 2, the latter is suddenly flung back against the surface of the printing roller 1. Under these conditions, the noise generated by the shock of the printing means on the surface of the sheet or strip suddenly thrown against the surface of the printing roller is preceded by the impact noise of the printing means on the sheet or strip itself ; now this sheet or strip which is not at this moment supported on the surface of the roll and which possesses a natural relative rigidity, is put into vibration by the shock and, acting as a loudspeaker diaphragm, amplifies the vibration and generates considerable noise.

To avoid this drawback, it is necessary , in the course of printing, for the print support to be well applied against the printing roller. It is known to resort to a roller arrangement situated downstream of the printing roller which enables ,in principle, this objective to be reached.

However this known arrangement has this major drawback of possessing a roller equipped with a single drive roller ; in the case where the print support is constituted by manifold paper (wad of several sheets of paper) such as the self-copying paper currently used today, only the sheet in contact with the drive roll is suitably driven, whilst the other sheets are poorly or not driven at all. As a result unfolding of the manifold paper and blocking of the machine occurs.

It is therefore essentially an object of the

invention to overcome this drawback and to provide an improved arrangement of a printing machine which enables a tension of the print support on the printing roller to be ensured such that the noise generated in
5 the printing region, during the operation of the machine, is diminished as far as possible whatever the type of print support used.

GENERAL DESCRIPTION OF THE INVENTION

To these ends, in a printing machine arranged to
10 print a print support on sheet or strip form and comprising :

- a printing roller over which the print support is wound and thrust in the course of the printing process,
- 15 - printing means to print the print support and thrust it against the printing roller,
- advance means situated upstream of the printing means (in the direction of passage of the print support) adapted to move the print support, and
- 20 - tensioning means for the print support comprising a set of two rolls forming a roller mill which are rotated with a speed greater than the speed of advance communicated to the print support by the above- said advance means and which are adapted to place the print
25 support under tension and to apply it against the surface of the printing roller in the zone of action of the printing means, said tensioning means being situated downstream of the printing means (in the direction of passage of the print support),
- 30 - it is provided, according to the invention, for the two rolls of the roller mill to be drive rolls, have the same diameter and be driven at the same speed.

Due to this arrangement, the two surfaces of the

print support are urged simultaneously into traction, at identical speeds without disturbances resulting therefrom in the advance of this support. This is of very particular and primary importance for manifold paper of which the two end sheets of the bundle are driven positively by the action of the drive rolls on their respective outer surface ; the other sheets (inner sheets) are then themselves also driven without any problem through friction by reason of the high friction which the sheets of paper exert between one another.

In addition, it is also ensured that the sheet or print strip is constantly applied against the surface of the printing roller and the previously mentioned air wedge no longer exists : the sheet or strip can no longer be placed in vibration under the shock of the printing means and the removal of this source of noise procures a notable lowering in the sound level in the course of the operation of the machine which reduction can reach something of the order of two to three dB.

In a preferred embodiment, the advance means for the print support comprise a first drive roll system situated upstream of the print means wherein the tensioning means for the print support comprise a second drive roll system situated downstream of the printing means, said second drive roll system being rotated with a speed higher than the rotary speed of the first drive roll system.

Advantageously, in this case, the speed of rotating the second drive roll system is higher by 1 to 3% than the rotary speed of the first drive roll system.

In a particular embodiment, the first drive roll

system comprises a drive advance roll for the advance of the paper urged around against the printing roller, upstream of the printing means and the second printing roll system comprises 2 rolls forming a roller mill
5 situated downstream of the printing means, one at least of these rollers being a drive roller.

The invention will be better understood on reading the detailed description which follows of a preferred embodiment of the invention given purely by
10 way of illustrative example, and in which a reference is made to the accompanying drawing in which Figure 2 shows very diagrammatically an arrangement of a printing machine according to the invention.

15 In Figure 2, which is established correspondingly to Figure 1 relating to the state of the art, the same members are designated by the same numeral references.

According to the invention, there are positioned
20 downstream of the printing means 5 additional drive means for the sheet or print support strip 2 arranged so that the latter are flattened constantly against the surface of the printing roller 1 opposite the printing means 5. As shown the sheet or strip 2 is
25 passed into another capstan or roller mill system constituted by two rolls 7 and 8 rotated by drive means (not shown) ; the rolls 7 and 8 have a rotary speed higher than that of the advancing roller 4 ; the difference in speeds of rotation of the roller 7 and 8
30 and of the roller 4 must be sufficient for the sheet or strip 2 to rest constantly flattened against the surface of the roller 1 but must however not be excessive so as to avoid the tearing of the sheet or

strip 2 and so that the advance (in principle a step
wise advance for a line by line printing) of the print
support actuated by the advance roller 4 is not
disturbed by the traction exerted by the rollers 7 and
5 8 . An excess speed of the rollers 7 and 8 of the
order of 1 to 3% with respect to the speed of the
roller 4 seems to be the most appropriate. Of course,
still for the purpose of avoiding tearing of the print
support 2 , the drive means of the rolls 7 and 8 may
10 be arranged to absorb (for example, presence of an
intermediate partial clutching or slippage device) to
absorb this differential speed.

In order that the print support 2 may be driven
regularly whatever its type manifold self-copying
15 paper, for example), the two rollers 7 and 8 have the
same diameter and are driven at the same speed , so
that they exert traction forces which are
substantially equal on the two outer surfaces of said
print support 2.

20 As is self-evident and as emerges besides already
from the foregoing , the invention is in no way
limited to those of its types of application and
embodiments which have been more especially envisaged;
it encompasses, thereof , on the contrary , all
25 modifications.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

... Printing assembly which is adapted for printing on a print medium in a form of a sheet or tape comprising:

a printing cylinder on which is wound and urged said print medium during a printing operation;

printing means to print on said print medium and to urge it against the printing cylinder;

advance means upstream of said printing means to advance said print medium;

tensioning means downstream of said printing means for tightening the print medium against said printing cylinder, comprising:

two contra-rotating rollers having substantially smooth outer surfaces in contact from opposite sides of said print medium, allowing sliding at said contacting surfaces and providing for tensioning of the print medium on said print cylinder;

said rollers being of the same diameter and both motor-powered and driven at the same rotational velocity, said rotational velocity being greater than the advance velocity of said advance means;

and means for pulling said rollers elastically towards each other with substantially constant and identical forces,

respectively.



2. Printing assembly as in Claim 1, wherein the rollers of said tensioning means are metal and have polished surfaces.

3. Printing assembly as in Claim 1, wherein the rollers of said tensioning means each have an external polished metal surface.

4. Printing assembly as in Claim 1, wherein said advance means comprises at least one advance roller and the rotational velocity of said tensioning rollers is 1 to 3% greater than that of said advance roller.

5. Printing assembly as in Claim 1, wherein said tensioning rollers are coupled together by a rotation transmission device comprising two driving rollers which are connected together by an elastically deformable endless strap wound around their peripheries and rotate respectively with said tensioning rollers.

6. Printing assembly as in Claim 5, wherein said endless strap is a helical spring connected in a loop.

DATED this 22nd day of August, 1990

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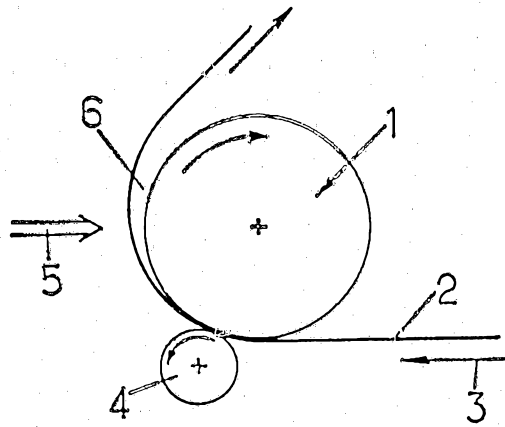


FIG. 1.

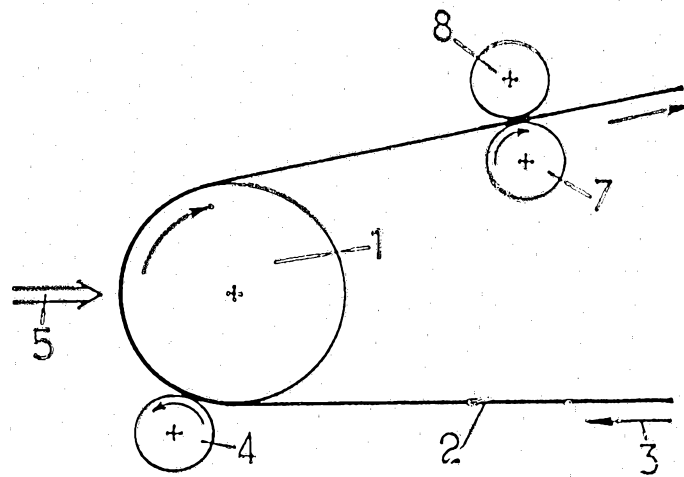


FIG. 2.