



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 060 884 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
20.12.2000 Bulletin 2000/51

(51) Int. Cl.⁷: **B41F 27/00, B41F 5/20**

(21) Application number: **00110984.2**

(22) Date of filing: **29.05.2000**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **08.06.1999 IT BO990311**

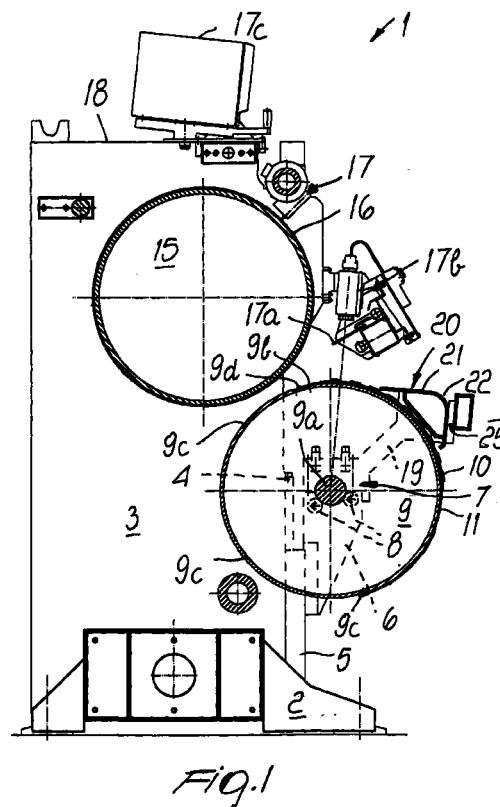
(71) Applicant: **Bieffebi S.p.A.**
40050 Quarto Inferiore (Bologna) (IT)

(72) Inventor: **Zanoli, Alberto**
40010 Sala Bolognese (Prov. of Bologna) (IT)

(74) Representative:
Modiano, Guido, Dr.-Ing. et al
Modiano & Associati SpA
Via Meravigli, 16
20123 Milano (IT)

(54) **Mounting device for flexographic printing plates**

(57) A mounting device for flexographic printing plates which can be applied to a machine (1) for mounting at least one flexographic printing plate (10) and for performing print tests, the machine being provided at the front, in a horizontally parallel and mutually movable arrangement, with an impression roller (15), with a printing cylinder (9) which is meant to be covered by a mounting sleeve (11), and with optical means adapted to register points of the impression roller with points of the printing plate viewed by transparency, the printing plate being fixable to the mounting sleeve by means of double-adhesive tape, the device comprising a longitudinal member (20) which is parallel to the cylinders and forms, in an upward region, a substantially flat surface (21) which is co-planar with respect to the upper plane of tangency of the printing cylinder (9) and lies in front of it.



EP 1 060 884 A1

Description

[0001] The present invention relates to a mounting device for flexographic printing plates in machines for mounting printing plates and for performing print tests.

[0002] Conventional flexographic printing plates are coated with a polyester film on their smooth face in order to give them stability over time. The face is fixed by means of a double-adhesive tape to a mounting sleeve, made of polyester and like, which is appropriately fixed to the printing cylinder of the machines, on which there are systems for locking and tensioning the polyester mounting sleeve.

[0003] In these machines, the printing cylinder or printing plate cylinder has a slot and oblique slits. A profiled strip having a complementarily shaped cross-section engages in the slot and supports a flap of the mounting sleeve; the other flap of the mounting sleeve is fixed by means of straps and a hook in the oblique slits so as to tension the mounting sleeve on the printing cylinder.

[0004] Preparation of the print pattern ends with a print test, by moving the print cylinder toward an impression roller which is covered with paper sheets and is rotatably arranged parallel to the printing cylinder.

[0005] A problem that is often noted and strongly felt by the graphics industry is due to the fact that when preparing print patterns by using large flexographic printing plates for printing on corrugated cardboard and the like, the printing plate separates from the polyester mounting sleeve after mounting/fixing, on the printing cylinder, and the print test. In particular, this separation becomes apparent in the form of bubbles or of a partial separation of the mounting sleeve and the polyester film of the printing plate, and it occurs, due to the excessive weight, during the storage period between two print runs of the graphic item to be produced. This makes it impossible to use the entire system.

[0006] The aim of the present invention is to eliminate the drawbacks noted above, by providing a mounting device for flexographic printing plates in which by using a printing cylinder it is possible to avoid separation of the printing plates from the mounting sleeve.

[0007] Within the scope of this aim, an object of the present invention is to provide a device which allows to perform the operations for mounting and fixing the printing plate on the printing cylinder very quickly and precisely.

[0008] Another object of the present invention is to achieve the above aim and object with a structure which is simple, relatively easy to provide in practice, safe in use, effective in operation and having a relatively low cost.

[0009] Another object of the present invention is to provide a device which can be easily obtained starting from commonly commercially available elements and materials and can also assume various configurations.

[0010] This aim and these objects are achieved by

the present mounting device for flexographic printing plates, which can be applied to a machine for mounting at least one flexographic printing plate and for performing print tests, said machine being provided at the front, in a horizontally parallel and mutually movable arrangement, with an impression roller, with a printing cylinder which is meant to be covered by a mounting sleeve, and with optical means adapted to register points of the impression roller with points of the printing plate viewed by transparency, said printing plate being fixable to said mounting sleeve by means of double-adhesive tape, wherein the device comprises a longitudinal member which is parallel to said roller and cylinder and forms, in an upward region, a substantially flat surface which is co-planar with respect to an upper plane of tangency of said printing cylinder and lies in front of it.

[0011] Further characteristics of the invention will become apparent from a detailed description of a preferred but not exclusive embodiment of a mounting device for flexographic printing plates according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a schematic sectional view of a machine for mounting printing plates and performing print tests to which the device according to the invention is applied;

Figure 2 is an enlarged sectional view, taken along a transverse vertical plane, of the device according to the invention during a different step of operation; Figure 3 is a plan view of a prepared printing pattern;

Figure 4 is a profile view of the printing pattern;

Figure 5 is a sectional view of a detail of the profile of said printing pattern; and

Figure 6 is a view of the device of the invention applied to the machine during conventional operation.

[0012] With reference to the above Figures, the reference numeral 1 generally designates a machine for mounting flexographic printing plates and for performing print tests to which a device for mounting flexographic printing plates according to the invention is applied.

[0013] The machine 1 comprises a footing 2 on which side walls 3 rest (see Figure 1). Guides 4 for the sliding of sliders 5 which carry supports 6 rise vertically parallel to the side walls 3 and in front of them. Supports 6 accommodate, at their tops 7, bearings 8 which horizontally and rotatably support a printing cylinder 9 by means of pivot-like axial ends 9a.

[0014] The printing cylinder 9 is movable, by virtue of the sliders 5, between a mounting position and a raised print test position.

[0015] In the mounting position, a printing plate 10 is positioned and fixed on a mounting sleeve 11, preferably made of polyester, which covers the printing cylinder 9 by means of a polyester film 10a of the printing

plate 10 made of photopolymer and a double-adhesive tape 12 (see Figures 3, 4 and 5), thus forming the print pattern.

[0016] The mounting sleeve 11 has (see Figures 1, 2, 3 and 4), on a first flap 11a, a profiled strip 11c which can engage a first slot 9b which has a complementary cross-section and is provided in the printing cylinder 9, whereas on the second flap 11b the mounting sleeve 11 has through holes 11d. Holes 11d are engaged by a hook 13a which is connected to a tensioning band 13 which has, at its other end, a pawl 14 which can engage a second slot 9d or one of the several advantageously spaced slits 9c provided on the printing cylinder 9 in order to make the mounting sleeve 11 adhere to the printing cylinder 9.

[0017] In the raised print test position, the printing cylinder 9 makes contact with an impression roller 15 which can rotate parallel to the printing cylinder 9 and is meant to be covered by a sheet of paper 16 which bears lines and dots formed by a stylus 17 and which are made to register, in the mounting position, with points of the printing plate seen against the light by virtue of optical means.

[0018] The optical means disclosed in EP 0728580 comprise a semitransparent mirror 17a and a TV camera 17b, which are arranged at the front of, and as an extension of, the impression roller 15, and monitors 17c located on the top 18 of the machine.

[0019] Arms 19 are connected at the tops 7 of the supports 6 and support a horizontal longitudinal member 20 which is parallel to, and located in front of, the printing cylinder 9, so as to leave a gap 23 between the printing cylinder 9 and the longitudinal member 20. The longitudinal member 20, preferably constituted by a profiled element, forms in an upward region a substantially flat surface 21 which is co-planar with respect to the upper plane of tangency of the printing cylinder 9. The surface 21 has, as a front extension, a rounded portion 22 which extends downwards. A cross-member 24, preferably having a box-like configuration, is located in front of the longitudinal member and is spaced therefrom; one face 24b of the cross-member is co-planar to the upper plane of tangency.

[0020] In the step before fixing the printing plate 10 to the mounting sleeve 11, the sleeve engages, by means of the profiled strip 11c of the first flap 11a, the first slot 9b of the printing cylinder 9. The mounting sleeve 11 is then passed over the surface 21, guided by means of the rounded 22 portion into the passage, in a downward direction, and is tensioned by means of the tensioning band 13, which engages by means of the pawl 14 the second slot 9d located in front of the first slot 9b.

[0021] During this step for mounting the mounting sleeve 11 flat on the printing roller, position sensors are active; such sensors are constituted by a first switch 26a and by a second switch 26b, both of which can be actuated by a cam and are adapted to limit the angular

stroke of the printing cylinder 90 in an interval of approximately 270° in order to prevent the mounting sleeve 11 from separating from the first and second slots 9b, 9d of the printing cylinder 9.

[0022] With reference to an initial position in which the slots 9b, 9d are proximate to the line that is perpendicular to the upper plane of tangency, the first switch 26a in fact prevents rotations of the printing cylinder 9 in the opposite direction with respect to the arrow A of Figure 2, since this would cause disengagement of the profiled strip 11c of the first flap 11a of the mounting sleeve 11 at the longitudinal member 20, whereas the second switch 26b enables rotations in the direction of the arrow A up to a value of approximately 270° , beyond which the pawl 14 of the tensioning band 13 would disengage at the longitudinal member 20.

[0023] Advantageously, the device according to the invention applied to the machine provides for the fixing of several printing plates simultaneously.

[0024] In operation, in order to fix the printing plate 10 flat on the mounting sleeve 11, the sleeve is made to move in the direction A of the arrow from the surface 21 to the printing cylinder through the passage 25 and is then guided at a portion 11e by means of the rounded portion 22 on the surface 21, so that a wide portion of the mounting sleeve 11 is co-planar to the plane of arrangement defined by the surface 21. At this point it is possible to fix the printing plate 10 flat on the mounting sleeve 11, the printing plate resting with an end portion on the face 24b of the cross-member 24 so that it is extended flat during fixing.

[0025] After fixing the printing plate 10 flat on the mounting sleeve 11 by means of the double-adhesive tape 12, the tensioning band 13 is removed and replaced by another shorter one and is engaged in one of the several slits 9c, so that the print pattern thus prepared passes through the passage 23 during the print test.

[0026] If the printing plate 10 is not large, it is possible to use conventional mounting, in which the mounting sleeve 11 surrounds the printing cylinder 9, passing through the passage 23 (see Figure 6). During fixing, the printing plate 10 rests on the surface 21 and on the face 24b, moving in the direction from the surface 21 to the printing cylinder 9.

[0027] It has thus been observed that the invention achieves the intended aim and objects, allowing to mount printing plates on sleeves in a flat configuration by means of a device which is easy to provide and can be applied to any machine for mounting printing plates and performing print tests and to machines that are already in use.

[0028] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

[0029] All the details may furthermore be replaced with other technically equivalent ones.

[0030] In practice, the materials used, as well as the

shapes and the dimensions, may be any according to requirements without thereby abandoning the scope of the appended claims.

[0031] The disclosures in Italian Patent Application No. BO99A000311 from which this application claims priority are incorporated herein by reference.

[0032] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A mounting device for flexographic printing plates which can be applied to a machine for mounting at least one flexographic printing plate and for performing print tests, the machine being provided at the front, in a horizontally parallel and mutually movable arrangement, with an impression roller, with a printing cylinder which is meant to be covered by a mounting sleeve, and with optical means adapted to register points of the impression roller with points of the printing plate viewed by transparency, the printing plate being fixable to the mounting sleeve by means of double-adhesive tape, said device being characterized in that it comprises a longitudinal member which is parallel to the cylinders and forms, in an upward region, a substantially flat surface which is co-planar with respect to the upper plane of tangency of the printing cylinder and lies in front of it.
2. The mounting device according to claim 1, characterized in that said surface is provided at the front with a rounded portion which is directed downwards, said surface being adapted to provide a horizontal flat support for the fixing of said printing plate to said mounting device, which is meant to be moved, during said fixing, by said printing cylinder in the direction from said surface to said printing cylinder, said rounded portion being adapted to guide, during said fixing, a portion of said mounting device that arrives from below.
3. The mounting device according to claim 1, characterized in that it comprises a front cross-member which is spaced from said longitudinal member and has a substantially flat face which is co-planar to said upper plane of tangency of said printing cylinder.
4. The mounting device according to claim 3, characterized in that said longitudinal member and said front cross-member are supported by arms which are connected to supports which are vertically slideable.
5. The mounting device according to claim 1, characterized in that a passage is provided between said longitudinal member and said printing cylinder for the passage of said mounting device once the flat fixing of said printing plate on said mounting device is complete.
6. The mounting device according to claim 1, characterized in that it comprises position sensors which are adapted to limit an angular stroke of said printing cylinder.

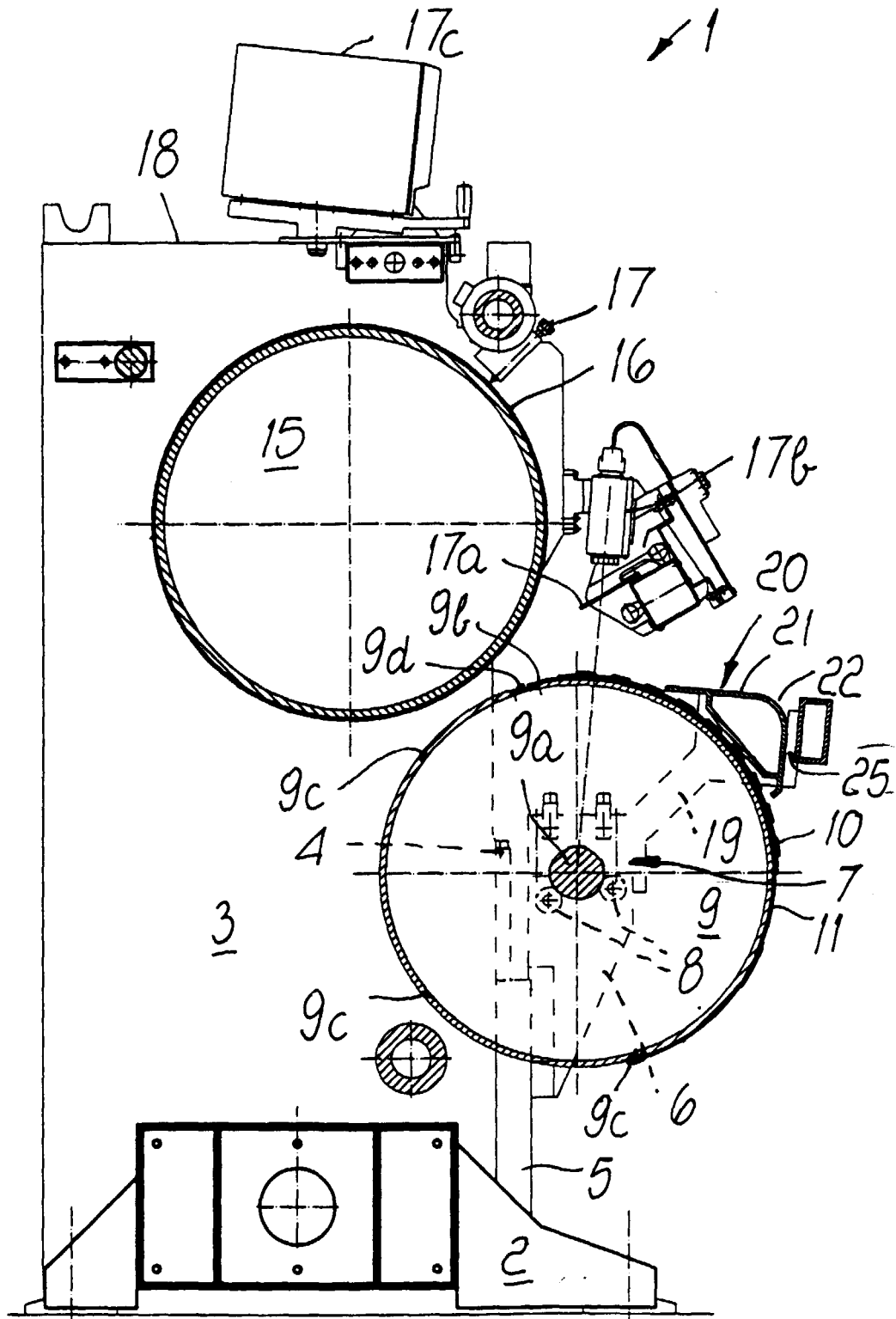


Fig. 1

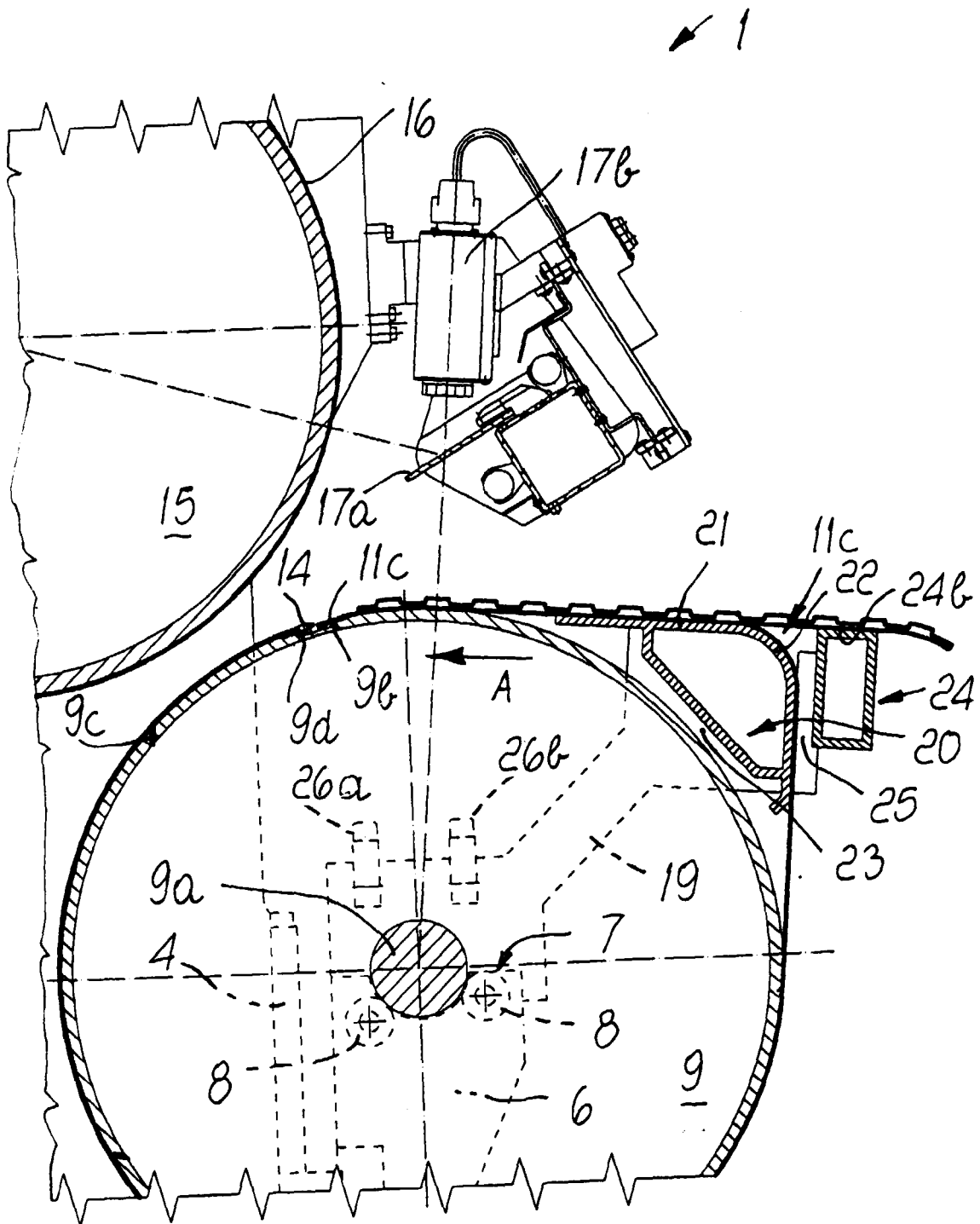
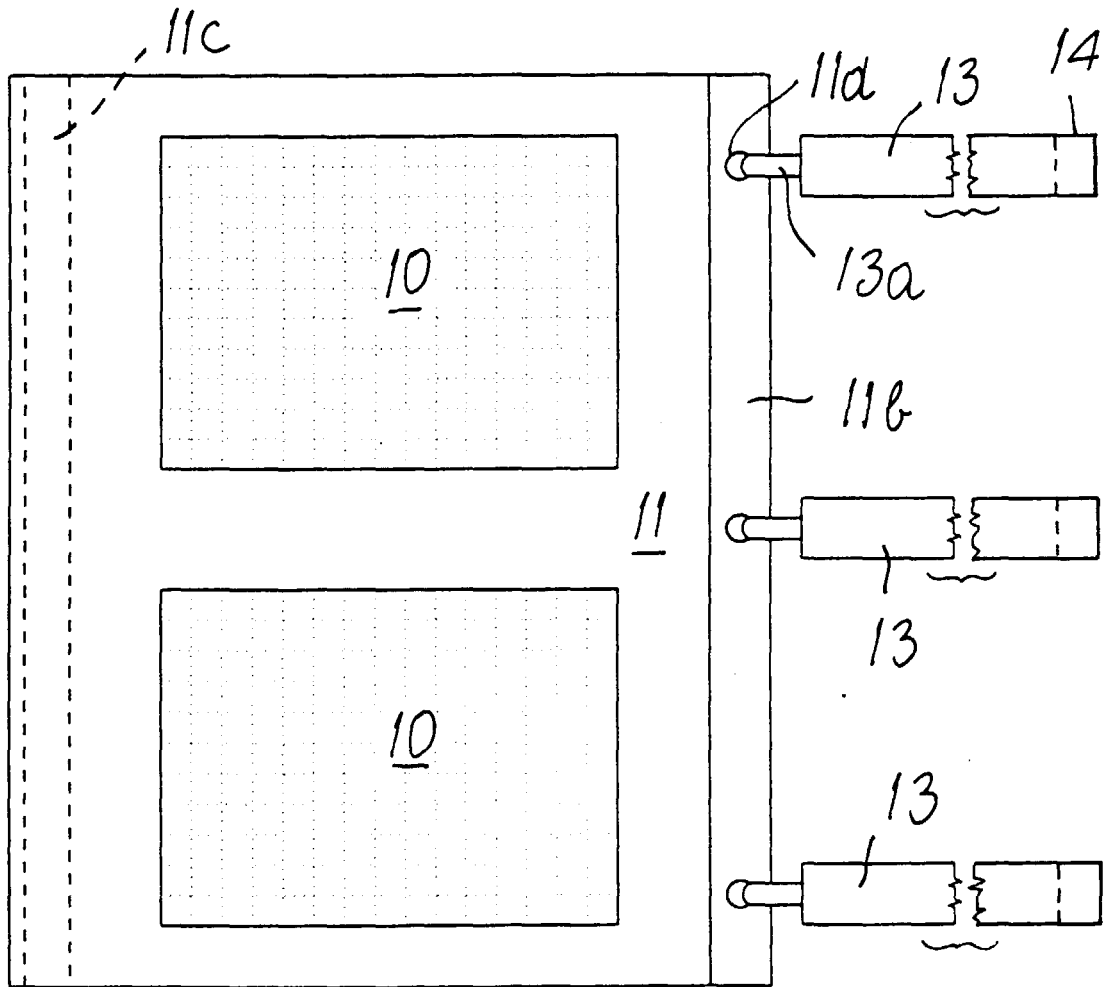
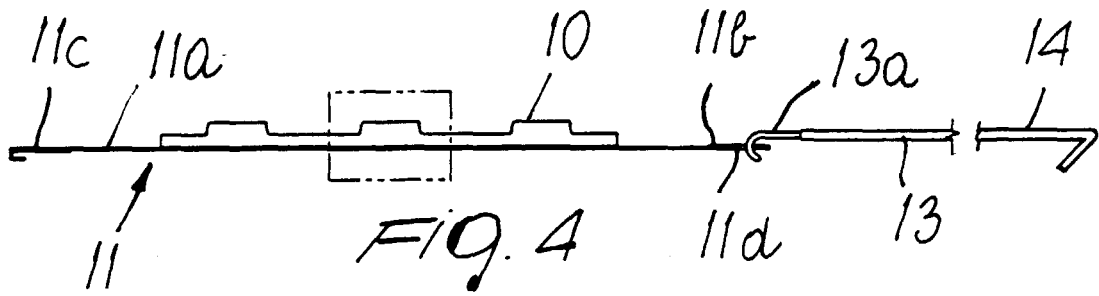


Fig. 2



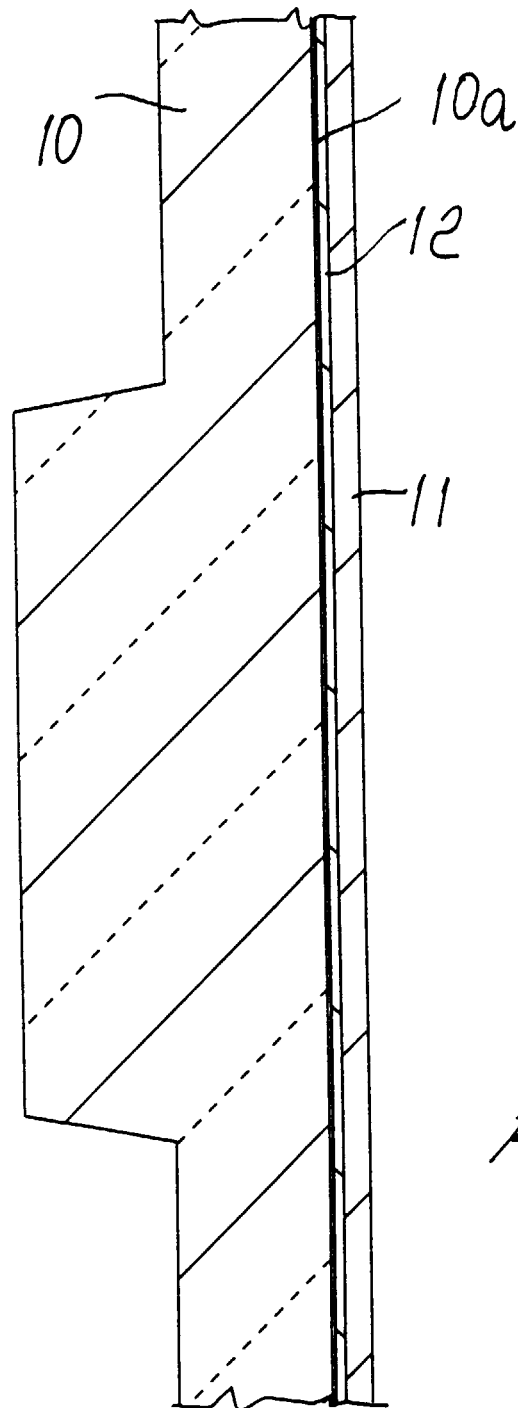


Fig. 5

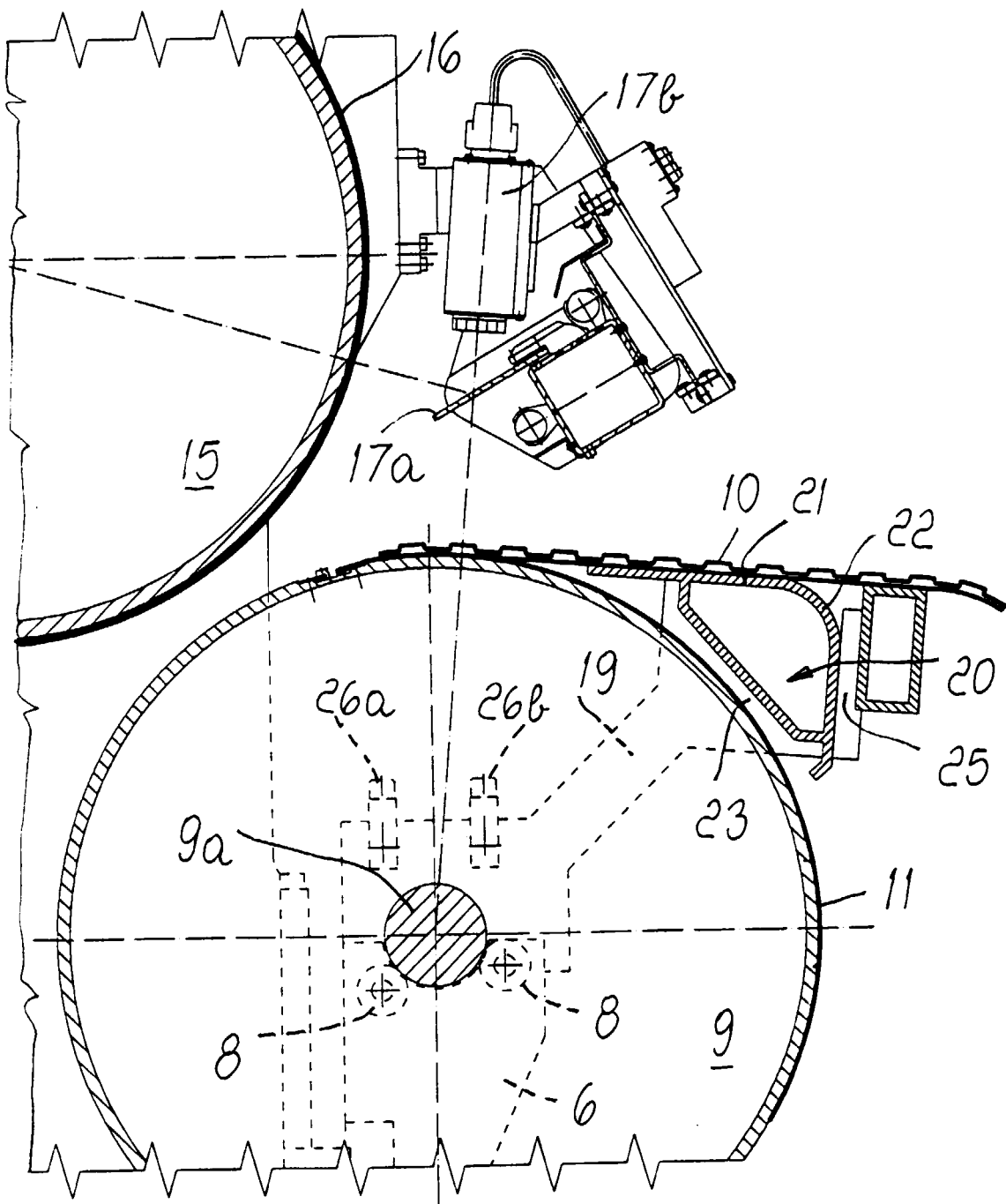


Fig. 6



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 11 0984

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X,D	EP 0 728 580 A (BIEFFEBI S.P.A.) 28 August 1996 (1996-08-28)	1,4,5	B41F27/00 B41F5/20
Y	see abstract * column 1, line 3 - column 8, line 34; figures 1-13 *	2,3,6	
Y	EP 0 808 714 A (KOENIG & BAUER-ALBERT AKTIENGESELLSCHAFT) 26 November 1997 (1997-11-26) * column 2, line 25 - column 3, line 18; figures 1-3 *	2,3	
Y	US 5 488 781 A (HANS VAN DER HORST) 6 February 1996 (1996-02-06) see abstract * column 1, line 6 - column 4, line 59; figure 3 *	6	
A	US 4 936 212 A (LESTER I. MOSS) 26 June 1990 (1990-06-26) * the whole document *	1-6	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	GB 1 018 686 A (JOHN & WM. BURT LIMITED) * the whole document *	1-6	B41F
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 18 September 2000	Examiner Greiner, E
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 11 0984

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-09-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0728580 A	28-08-1996	DE 69510766 D	19-08-1999
		DE 69510766 T	13-01-2000
		ES 2133703 T	16-09-1999
		US 5666881 A	16-09-1997
EP 0808714 A	26-11-1997	DE 19620997 A	27-11-1997
		JP 10044374 A	17-02-1998
		US 5806431 A	15-09-1998
US 5488781 A	06-02-1996	NONE	
US 4936212 A	26-06-1990	NONE	
GB 1018686 A		NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82