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EUROPEAN PATENT APPLICATION

21 Application number: 83109669.8

51 Int. Cl.³: D 03 D 49/20

22 Date of filing: 28.09.83

30 Priority: 01.10.82 IT 2357382

43 Date of publication of application:
09.05.84 Bulletin 84/19

84 Designated Contracting States:
AT BE CH DE FR GB LI LU NL SE

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54 System to obtain a reciprocal differentiated pressure in the contact between two cylinders in looms.

57 System to obtain a reciprocal differentiated pressure between the cloth-pressing bar (2) and the cloth-pulling roller (1) of a weaving loom, wherein the cloth-pressing bar (2) has a differentiated geometrical structure and/or configuration along its longitudinal axis, and wherein the contact between the cloth-pulling roller (1) and said bar (2) is obtained thanks to variations in the structure of such bar, apt to produce a supplementary differentiated elastic pressure in the zones of contact with said roller, in correspondence of which there are such variations.

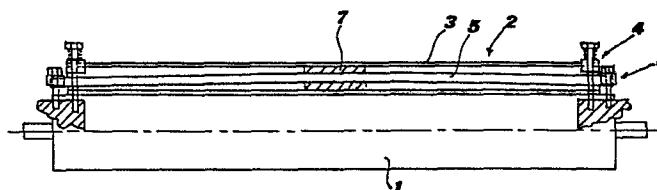


FIG. 1

"SYSTEM TO OBTAIN A RECIPROCAL DIFFERENTIATED PRESSURE IN THE CONTACT BETWEEN TWO ROLLERS IN LOOMS"

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5 This invention concerns a system to obtain a reciprocal differentiated pressure in the contact between two rollers, particularly between the cloth-pulling roller and the cloth-pressing bar of a loom.

As known, the productiveness of modern weaving machines is influenced, as well as by the loom speed, also by the weaving width: there is therefore a trend to increase the width of weaving machines.

10 Obviously, this will involve problems of structural nature, connected with the loads to which the machines and their parts are subjected.

15 A particular problem is that connected with the warp yarn tension and with the adherence of the fabric to the cloth-pulling roller, which is an essential condition to obtain the "right feel" in the fabric and prevent even serious weaving defects (mainly deriving from possible variation of the number of wefts per centimeter).

20 In fact, the increase of weaving width requires the weaving machine to be longer and hence makes all the loom structure more flexible. During working, this may determine a reduction or the failure of adherence between the cloth-pulling roller and the fabric, as the cloth-pulling roller tends to move at the centre of the loom away from the cloth-pressing bar which ensures said adherence, also because the increase of length of the cloth-pulling roller and of the
25 cloth-pressing bar limits the influence, at the centre of the loom, of any lateral pressure members: in other words, at the centre of the loom, the engagement is merely determined by the weight of the cloth-pressing bar, which is often not sufficient.

30 The present invention proposes to solve this problem by realizing a differentiated distribution of the pressures between the cloth-pressing bar and the cloth-pulling roller, allowing to obtain also at the centre of the loom, or more generally in correspondence

of any critical zones, for transporting the fabric without any slippings, a proper adherence of such fabric onto the roller around which it winds as it is being produced.

For this purpose the invention provides a system to obtain a
5 reciprocal differentiated pressure in the contact between two rollers, characterized in that, one of said rollers - particularly the cloth- pressing bar - has a differentiated geometrical structure and/or configuration along its longitudinal axis, and in that, the contact with the second roller - particularly the cloth-pulling
10 roller - is obtained thanks to variations in the structure of the first roller, apt to produce a supplementary differentiated elastic pressure in the zones of contact with the second roller, in correspondence of which there are such variations.

The invention can be realized in a wide variety of embodiments,
15 some of which are illustrated in the accompanying drawings, by mere way of example and without of course introducing any limitation. In such drawings, which all refer to the application of the system of pressure contact between rollers, in the case of cloth-pulling rollers and cloth-pressing bars of looms:

20 Fig. 1 is a longitudinal view of a unit comprising a cloth-pulling roller and a cloth-pressing bar according to a first embodiment of the system of the present invention;

Figs. 2 and 3 are side views showing the assembly of the elements forming the cloth-pressing bar of the unit of fig. 1;

25 Fig. 4 shows a variant of the system according to the invention illustrated in figs. 1 to 3;

Fig. 5 is a longitudinal view of another embodiment of the system according to the invention, of which:

Fig. 6 shows a variant;

30 Fig. 7 is a longitudinal view of a still further embodiment of the system according to the invention;

Fig. 8 is a side view showing the assembly of the cloth-press-

ing bar of the embodiment of fig. 7;

Fig. 9 is a longitudinal view of a simplified cloth-pulling roller and cloth-pressing bar unit according to the invention;

Fig. 10 shows how the system of fig. 9 can be integrated to improve its performances in special applications;

Fig. 11 is a longitudinal view of a cloth-pulling roller and cloth-pressing bar unit, according to a fluid pressure operated embodiment of the system according to the invention; and

Figs. 12 and 13 are side views showing some details of the system of fig. 11, fig. 13 being on an enlarged scale.

With reference to figures 1 to 3, the system according to the invention comprises a cloth-pulling roller 1, of conventional characteristics, to which there is associated a cloth-pressing bar 2 formed of an external tube 3, provided with a suitable covering and mounted rotatable on two end supports 4; of a metal bar 5, which is elastically deformed in respect of its originally bent configuration and is arranged inside the tube 3, fixedly mounted thereon by means of two pressing end supports 6; and of a bush 7, interposed at the centre of the unit between the bar 5 and the tube 3, so as to impart a pressure on this latter, while allowing the rotation thereof.

The two supports 4 for the tube 3 each comprise a shell 8, which is pivoted in 9 at one end, houses into a proper seat at the centre one end of the tube 3, and is subjected at the other end to the action of a locking setscrew 10, with the intermediary of a spring 11. The supports 6 each comprise a metal lever 12, which is pivoted in 13 at one end, houses at the centre one end of the bar 5, preventing the rotation thereof with suitable means 12A, and is subjected at the other end to the action of a locking setscrew 14.

The bar 5 originally has a deeply curved configuration, in respect of which it is elastically deformed by being bent until it can be inserted - substantially rectilinear - into the tube 3. Herein it is kept bent thanks to the supports 6, thereby imparting a strong

elastic pressure action onto the tube 3, through the bush 7; this ensures a highly efficient and continuous contact of the tube 3 onto the clothpulling roller 1, in the central zone - usually critical - of said roller and of the loom (in which zone appear the variations
5 of structure and of geometrical configuration of the cloth-pressing bar 2).-

As the critical zone of the contact between the two rollers 1 and 2 may obviously vary according to the structural characteristics of the loom, to its way of working, to the work performed and so on,
10 said zone may evidently differ from that concerned by the action of the bush 7 of figure 1. It is hence understood that the length of the bush 7 may be different, or else that the single bush 7 may be replaced by two or more bushes, according to requirements.

The embodiment in figure 4 of the system according to the invention actually shows the use of two bushes 15 and 16, appropriately spaced, interposed between the bar 5 and the tube 3 of the cloth-pressing bar 2 in the central zone of the loom.

In the embodiment of figure 5, the cloth-pressing bar 2 comprises also an external rotating tube 3 cooperating with the cloth-pulling roller 11, but the unit comprising the bar 5 and the bush 7 of
20 the solution of figure 1 has been replaced by a barrel-shaped bar 17, which has subsequently been elastically bent and kept so deformed by the supports 6, so as to have its generatrix in contact with the tube 3 substantially rectilinear. Said bar 17 produces the same effect as
25 the aforespecified unit, namely of ensuring efficient and continuous contact between the cloth-pressing bar 2 and the cloth-pulling roller 1.

It can easily be understood that, in the embodiment according to figure 5, the function of the supports 4 for the tube 3 is not essential, as the position of said tube can be ensured by the assembly
30 of the bar 17. Said supports could therefore also be eliminated, and this has actually been done in the embodiment of the system of figure

5 illustrated in figure 6.

The embodiment shown in figures 7 and 8 is somewhat different from the previous embodiments of the system according to the invention. In this case, the cloth-pressing bar 2 is obtained by associating to a tube 3, rotating within end supports as in the case of figure 1, a rectilinear bar 18 provided throughout its length with a projecting profile 19, suitably shaped in respect of the zones wherein a supplementary pressure is required. Said bar 18 is mounted with its ends 20 external to the tube 3 rotating in supports 21, and it is subjected to torsion by the action of screws 22 on levers 23 keyed thereon close to said ends (see figure 8), the screws 22 screwing into proper seats fixed to the loom casing, as shown in 24.

The action of the projecting profile 19 of the bar 18 onto the wall of the tube 3 (from the inside) ensures continuous and efficient contact between the cloth-pressing bar 2 and the cloth-pulling roller 1.

Also the embodiment illustrated in figure 9 differs from those of the system according to the invention described so far, this embodiment being of great simplicity from the conceptual and structural point of view, but probably fairly costly.

According to this solution, the cloth-pressing bar is shaped as a solid bar 25 (which could also be replaced by a very rigid metal tube), the original configuration of which is exactly rectilinear, but which is then kept bent by deflection - once it has been mounted on the loom - as a result of the slight inclination in respect of the axis of the roller 1, of the end supports 26 into which it is rotatably mounted. Also in this case - as can be easily gathered - a continuous and efficient contact between the rollers 1 and 2 is obtained in all the critical zones.

Figure 10 shows a variant, or rather an integration of the system of figure 9. As shown in this figure - which is a side view of the unit comprising the cloth-pressing bar and the cloth-pulling

roller of a weaving loom - to said unit there is added a continuous distribution carpet 27 which winds onto the cloth-pressing bar 2 and onto a supplementary bar 28, so as to adhere to the cloth-pulling roller 1 along a substantial width thereof. The function of the
5 carpet 27 is to distribute as evenly as possible the effects produced by the arrangement according to figure 9, in order to obtain a really efficient and uniform contact between the rollers 1 and 2, and a perfect guiding and dragging of the fabric which is obviously placed between the roller 1 and the carpet 27.

10 Of course, the integration provided by the arrangement of figure 10 could be applied to any other embodiment of the system according to the invention, and particularly to those already illustrated and to that described hereunder.

According to this last embodiment - shown in figures 11 to 13 -
15 the structure of the cloth-pressing bar 2 comprises a tube 29, rotating within fixed end supports 30, and a fixed tube 31 mounted inside the first. From the fixed tube 31 project two pluralities (see figures 11 and 12) of support bodies 32, mounted as pistons (see enlarged detail of figure 13) along a generatrix inside the wall of
20 said tube 31 and apt to press from within against the wall of the tube 29. The support bodies 32 are distributed according to a law depending on the effect of the contact between rollers 1 and 2 which one wishes to obtain, and in any case in a differentiated manner, as clearly shown in the drawing which provides a greater number of said
25 bodies in correspondence of the central zone of the loom. Into the appropriately staunch fixed tube 31, fluid under pressure is sent to push the support bodies 32 partially out of their seats in the wall of said tube, towards the revolving tube 29, according to the indication of the arrow 33 of figure 13. Though not shown, this
30 embodiment will evidently include sealing means for the fluid under pressure between the support bodies and the seats of the wall of the fixed inner tube, wherein such bodies are mounted and apt to slide.

This reproduces an effect of elastic strain of the zone of the bar 2 in contact with the roller 1, which ensures the desired differentiated pressure contact being the object of the invention.

It is understood that there could be many other practical embo-
5 diments of the invention, of which the various ones illustrated form,
as already said, only an indicative and by no means limitative
example.

CLAIMS

1) System to obtain a reciprocal differentiated pressure in the contact between two rollers, characterized in that, one of said rollers - particularly the cloth-pressing bar of a weaving loom - has
5 a differentiated geometrical structure and/or configuration along its longitudinal axis, and in that, the contact with the second roller - particularly the cloth-pulling roller of said loom - is obtained thanks to variations in the structure of the first roller, apt to produce a supplementary differentiated pressure in the zones of
10 contact with the second roller, in correspondence of which there are such variations.

2) System as in claim 1), wherein said variations in the structure of the first roller are obtained through elastic forces produced by elastically deformed elements forming part of said structure.

15 3) System as in claim 1), wherein said variations in the structure of the first roller are obtained thanks to the differentiated geometrical configuration of rigid elements forming part of said structure.

4) System as in claim 1), wherein said variations in the structure of the first roller are obtained thanks to the elastically
20 deformed geometrical configuration of said roller.

5) System as in claim 1), wherein said variations in the structure of the first roller are obtained by elastic deformation of some elements in said structure, produced by means of fluid pressure.

25 6) System as in claims 1) to 5), wherein to the first of said rollers - particularly the cloth-pressing bar of a weaving loom - there is associated a supplementary bar, as well as a distribution carpet kept in contact, along a substantial width, with the second roller - particularly the cloth-pulling roller of the loom - by said
30 first roller and by said supplementary bar.

7) System as in claims 1) and 2), wherein said first roller com-

prises a tube rotating on two end supports, a metal bar which is elastically deformed in respect of its originally bent configuration and is fixedly mounted within said tube, and a bush interposed between said bar and tube to impart on this latter a pressure, without
5 preventing the rotation thereof.

8) System as in claim 7), wherein at least two bushes are provided, interposed between the bar and the tube of said first roller.

9) System as in claims 1) and 2), wherein said first roller comprises a revolving tube and a barrel-shaped metal bar, elastically
10 deformed in respect of its originally bent shape, which is fixedly mounted inside the tube to impart a pressure on the wall thereof, without preventing its rotation.

10) System as in claims 1) and 3), wherein said first roller comprises a tube and a metal bar inside said tube, both rectilinear
15 and rotating on end supports, said bar comprising a shaped projecting profile, apt to innerly engage the tube wall and means being provided to adjust the angular position of the bar in respect of the tube, and thus the action imparted by said projecting profile on the tube itself.

20 11) System as in claims 1) and 4), wherein said first roller is formed of an originally rectilinear stiff bar, kept bent by elastic deformation, as a result of its mounting into end supports, which are slightly inclined in respect of the axis of the second roller, said bar rotating inside said supports.

25 12) System as in claims 1) and 5), wherein said first roller comprises: a tube rotating on two fixed end supports, a second fixed tube mounted inside the first, at least a plurality of support bodies, mounted as pistons along a generatrix of the fixed tube and pressing from within against the wall of the rotating tube, and means
30 apt to apply a fluid pressure onto said inner fixed tube, in order to forcefully push said support bodies against said external rotating tube.

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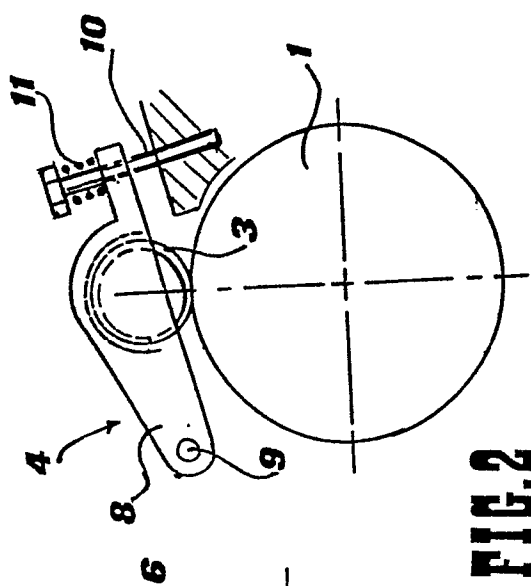


FIG. 2

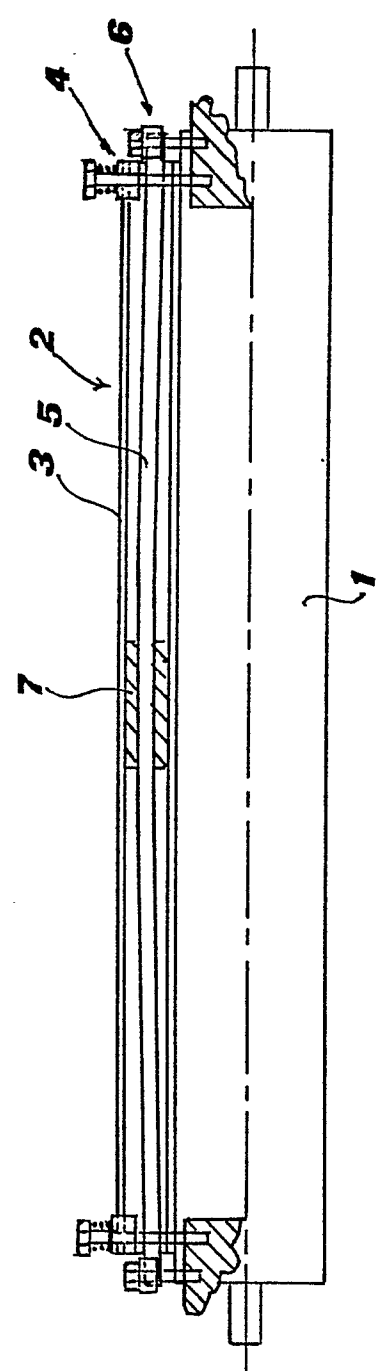


FIG. 1

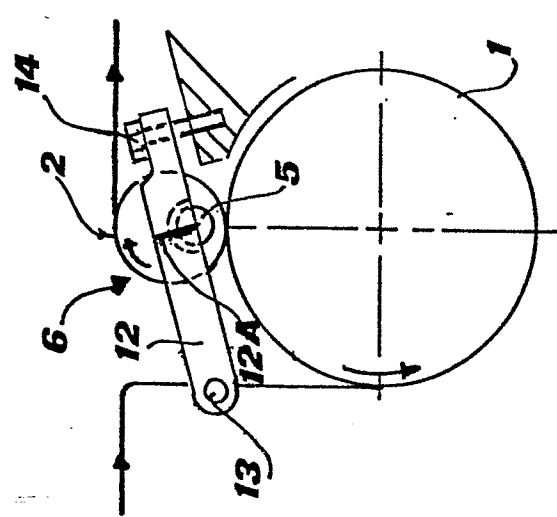


FIG. 3

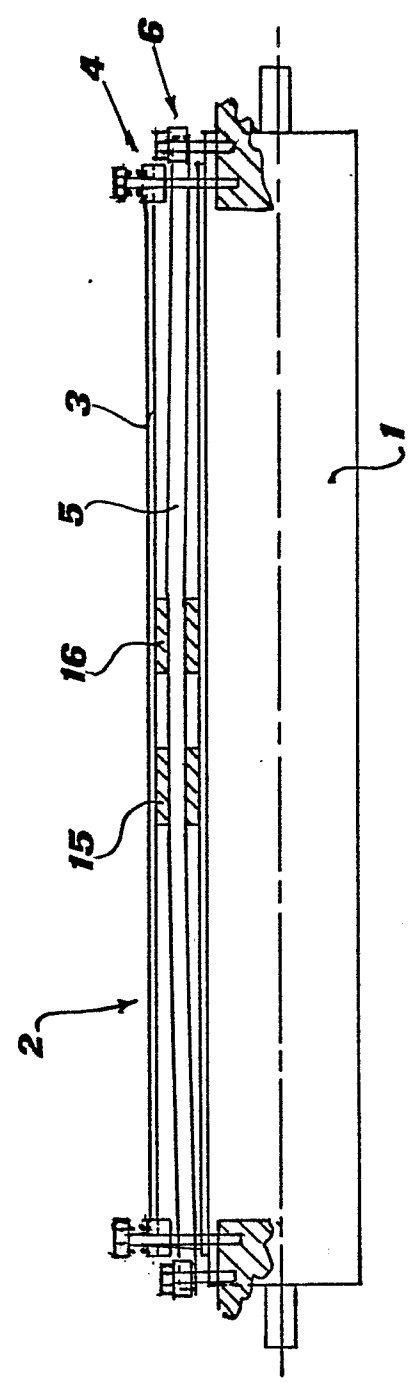


FIG. 4

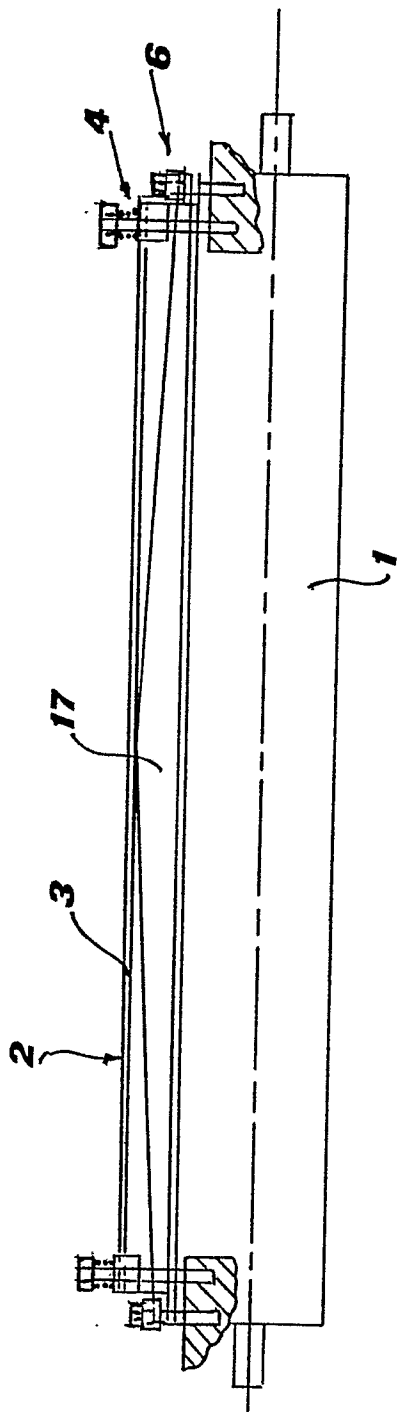


FIG. 5

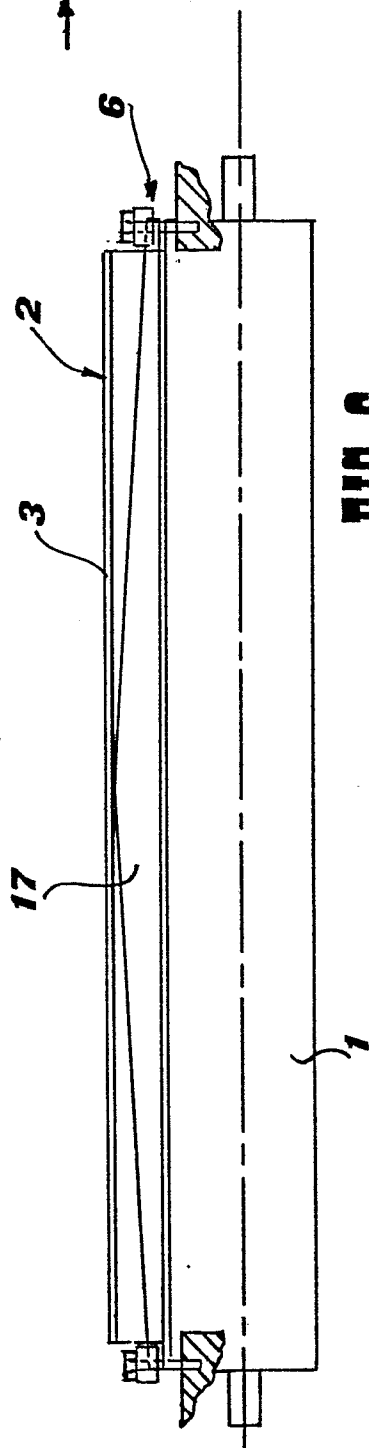


FIG. 6

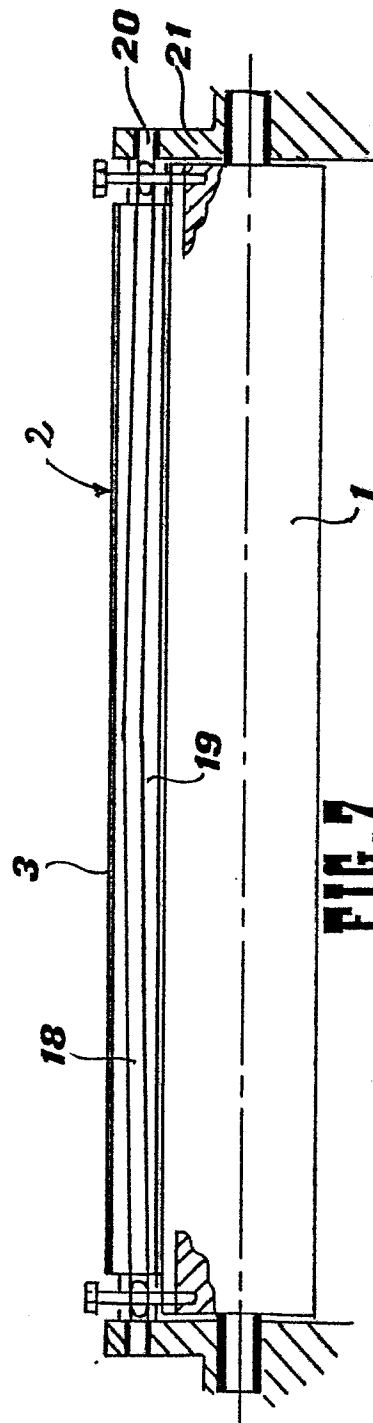


FIG. 7

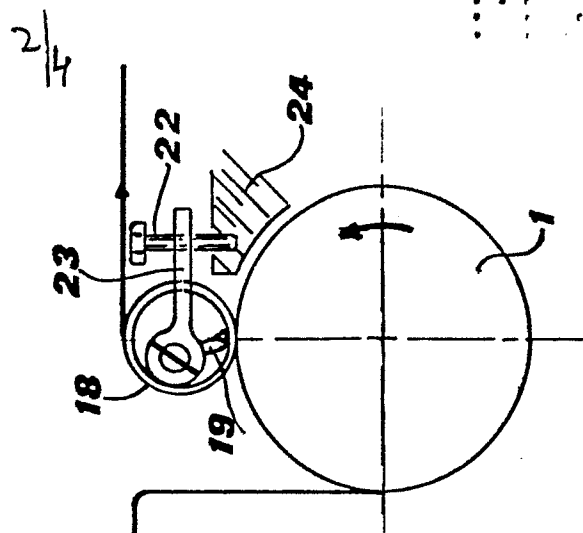


FIG. 8

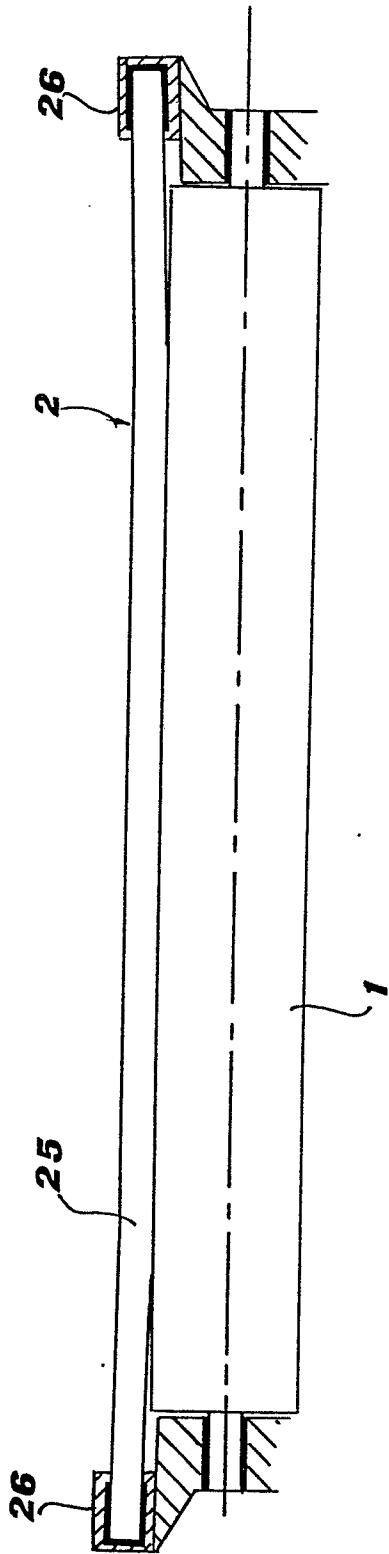


FIG. 9

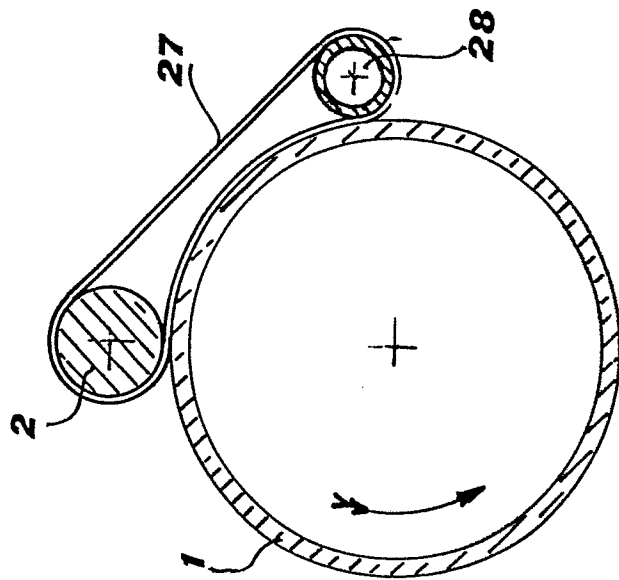
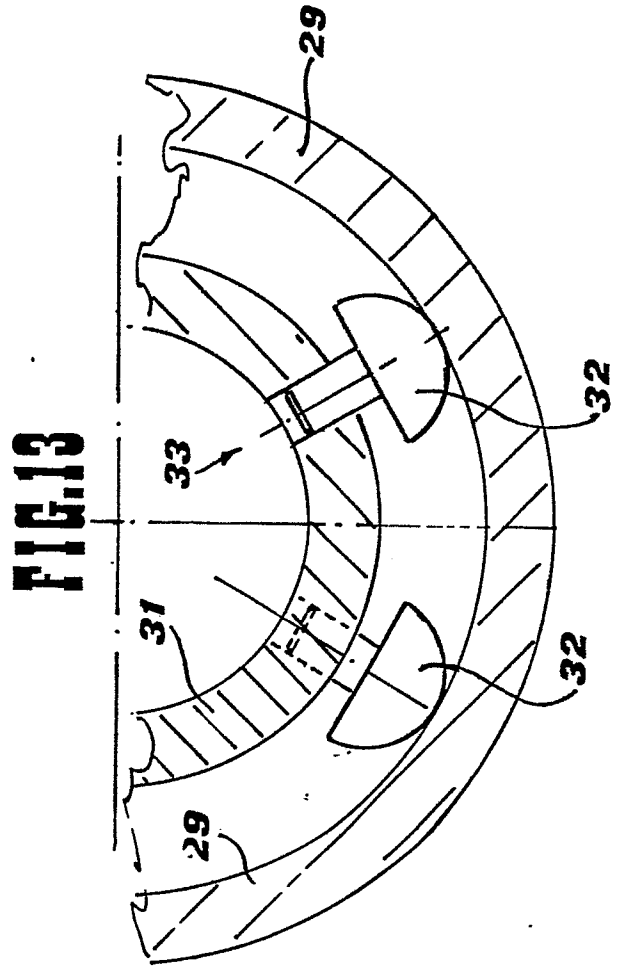
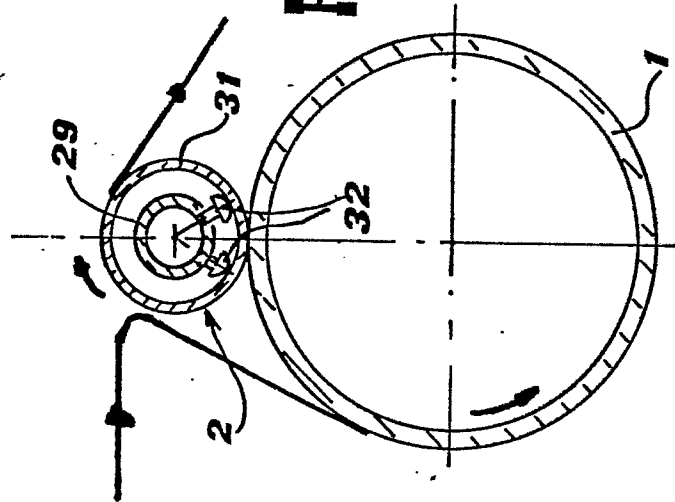
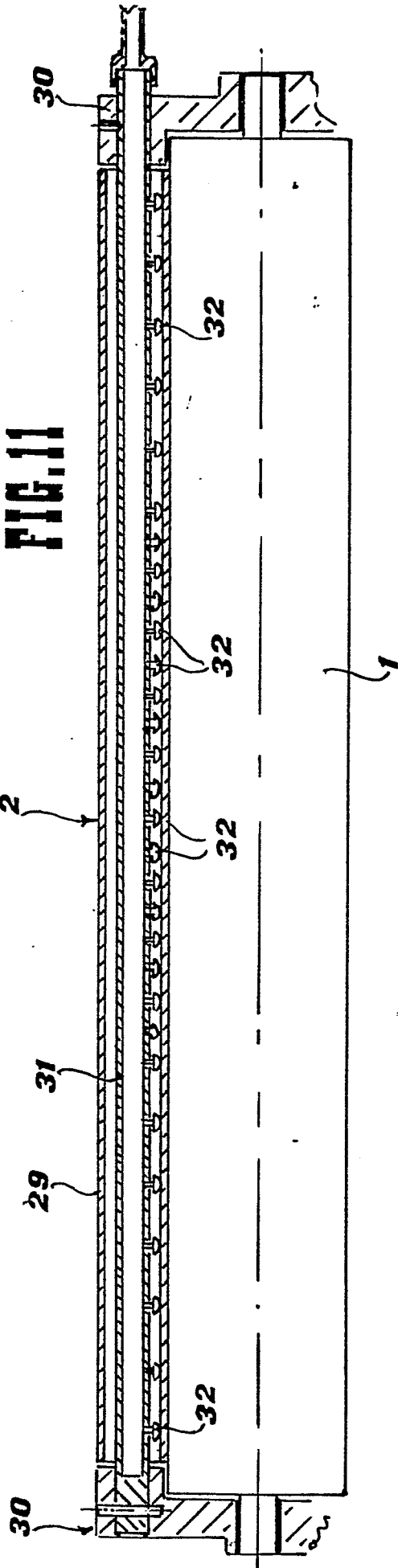


FIG. 10





European Patent
Office

EUROPEAN SEARCH REPORT

0107798

Application number

EP 83 10 9669

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. ³)
A	DE-A-2 335 638 (SULZER) -----		D 03 D 49/20
			TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
			D 03 D D 04 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 09-01-1984	Examiner BOUTELEGIER C.H.H.
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