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(71) Applicant: **Bertoldi, Attilio**
Via Magenta, 8
I-25025 Manerbio Brescia(IT)

(72) Inventor: **Bertoldi, Attilio**
Via Magenta, 8
I-25025 Manerbio Brescia(IT)

(74) Representative: **Luksch, Giorgio, Dr.-Ing. et al**
Ing. A. Giambrocono & C. S.r.l. Via Rosolino Pilo, 19/b
I-20129 Milano(IT)

(54) Blower machine for treating fabric in rope form.

(57) The machine comprises a chamber housing a centrifugal fan (8) which draws air from the chamber interior and conveys it into a diffuser (9) situated upstream of a pair of surfaces (for example cylinders 2, 3) which press against the fabric (T) to be treated, the fabric passing over the diffuser (9), to be swollen by the air stream which strikes it from the inside by emerging from apertures (11, 11′) provided in that wall (10) which delimits the diffuser (9) towards the fabric.

Some of the apertures (11′) are selectively closable so that when treating certain types of fabric all the slots (11, 11′) are open whereas the other types only some (11) are in the open state, whereas the remainder (11′) are closed.

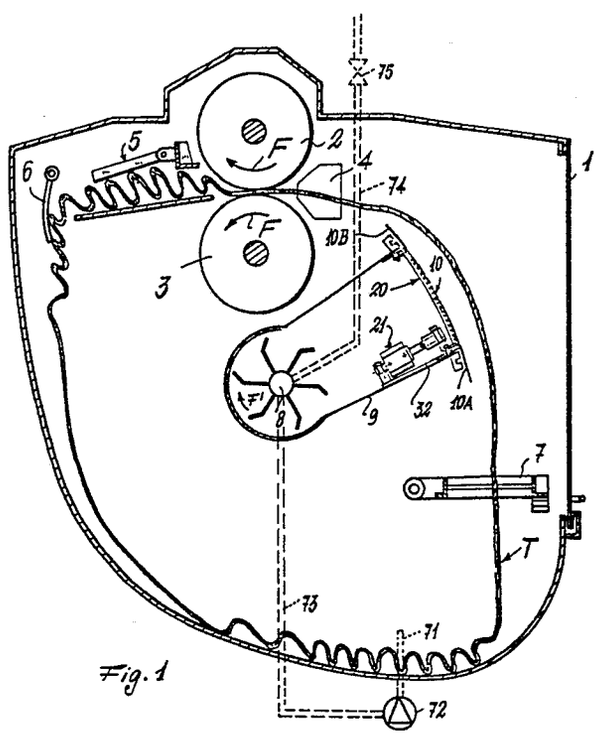

Fig. 1

EP 0 372 199 A1

BLOWER MACHINE FOR TREATING FABRIC IN ROPE FORM

This invention relates to a fabric treatment machine, particularly for fulling and scouring woollen or mixed woollen fabrics, comprising a chamber housing a centrifugal fan which draws air from the chamber interior and ccnveys it into a diffuser situated upstream of a pair of surfaces (such as cylinders) which press against the fabric to be treated, the fabric passing over the diffuser, to be swollen by the air stream which strikes it from the inside by emerging from slots or apertures provided in that wall which delimits the diffuser towards the fabric.

A machine of the described type is produced by the Italian company MAT di A. Bertoldi S.p.A., via Fermi 1, 25025 MANERBIO (BS), a modification of which, in which the air is drawn from the outside instead of from the inside of the chamber, is described in Italian patent 1,135,149 dated 23.1.1981 in the name of the present applicant.

Although the known machine satisfies the requirements of a large part of the textile sector, it only partly satisfies the requirements of the small although appreciable remaining part, namely that which produces fabrics requiring a lesser fulling depth or a substantial absence of that hairiness deriving from fulling by known machines.

The main object of the present invention is therefore to improve the machine of the indicated type so that it satisfies the various requirements of the textile sector.

A further object is to improve the machine of the indicated type so that it also satisfies the requirements of those operators in the textile sector who have only a limited machine availability so that a machine used for fulling heavy fabrics must also be able to be used for scouring light fabrics.

This and further objects which will be apparent from the detailed description given hereinafter are attained according to the invention by a machine of the indicated type, characterised essentially in that at least a fraction of the wall slots or apertures can be at least partly closed.

The invention will be more apparent from the detailed description given hereinafter by way of example with reference to the accompanying drawing in which:

Figure 1 is a schematic vertical longitudinal section through the machine of the invention;

Figure 2 is a detailed section through the slotted wall showing the means which control the slots; and

Figure 3 is a section on the line III-III of Figure 2.

In the figures the reference numeral 1 indicates a tank conventionally provided with a pair of fulling rollers, namely an upper 2 and a lower 3, but which can be replaced by other known fulling means able to exert a pressure on the fabric T. In the case of the rollers 2 and 3, these are rotated in the direction of the arrows F. The machine is also provided with jaws for height fulling, a fulling spout which can also comprise known rollers able to move away from and towards the fabric, and a knocking-off board 6. The fabric T is guided in its path, during repeated passages, by a conventional rack 7.

In the tank 1 there is located a centrifugal fan 8 suitably driven to rotate in the direction of the arrow F′ by a motor (not shown) and having an air intake within the tank 1 and a delivery which opens into a diffuser 9.

Said diffuser, which is situated on the inner side of the fabric as is the fan, is closed at its front by an arched wall 10 provided with slots 11, 11′ through which the air emerges.

As can be seen from Figures 1 and 2, the surface 10 is extended by closed appendices 10A, B both towards the jaws 4 and towards the rack 7, to form a guide for the feed of said fabric.

The machine enables fabrics to be wet-treated without the need for them to be sewn into tubular form because the air blown by the fan 8 causes the fabric to undergo the desired swelling, which is necessary for the following reasons:

a) to prevent the fabric rolling up in the direction of its length, and

b) so that as the fabric swells by filling with air, the creases which form during treatment are pneumatically smoothed.

In the particular embodiment of the invention illustrate herein, the slots 11, 11′ extend parallel to each other in the longitudinal direction of the wall 10 and are flanged inwards, as shown in Figure 3. On the inside of this wall there is provided a mobile shutoff member 20 which is controlled by a motor means 21 to close some of the slots while leaving the others open. Specifically, the shutoff member is arranged to close alternate slots, ie an always open slot 11 is followed by a closable slot 11′ (see Figure 3).

In this example, the mobile shutoff member 20 consists, in detail, of a grating formed from a series of circular parallel bars 22 lying on a surface which is parallel to that of the slotted wall. The bars are spaced apart by the same distance as the closable slots indicated by the reference numeral 11′. The slots which remain always open are indicated by the reference numeral 11.

The bars 22 are connected together at their upper and lower ends by two cross-members 23,

24. These cross-members are provided at their lateral ends with flanged guide pins 25 which penetrate into oblique straight slots 26 provided in a plate 27 rigid with the diffuser. The flange 25A of the lower pins 26 is used to support the grating 20.

At an intermediate point of the lower cross-members there is provided a pin 28 on which there is pivoted the adjustable-length rod 29 of a double-acting pneumatic cylinder-piston unit 30, the cylinder of which is pivoted on a pin 31 which extends upwards, as does the preceding pin, from a plate 32 rigid with the diffuser 9.

If a fabric is to be subjected for example to deep fulling, the shutoff grating 20 is positioned as shown in Figure 3, in which its bars intercept alternate slots 11′. This is done by operating the cylinder-piston unit 30 in the direction of the arrow F3.

The conventional procedure is then carried out, ie the fabric is loaded in rope form, and the rollers 2, 3, the fulling spout 5 and the centrifugal fan 8 are operated.

If a fabric is to be subjected for example to surface rather than deep fulling, the cylinder-piston unit 30 is operated in the opposite direction to the arrow F3. The effect of this combined with the inclined guide slots 26 is that the grating 20 moves parallel to itself in the oblique direction imposed by the guide slots 26, to halt in a position in which the bars are withdrawn from the closable slots 11′ and lie, as shown for example by the displaced bar 10X, aligned with the solid part R lying between two consecutive slots (11′ and 11). When this has been done the fulling spout 5 is deactivated by opening it to the free passage of the fabric T, the fabric is loaded and the rollers 2, 3 and the centrifugal fan 8 are operated.

Figure 1 also shows an arrangement which enables the fan 8 to be also used to feed water through the fabric T. For this purpose a pipe 71 extends from the base of the tank 1 and is connected to a pump 72, from which a pipe extends to the intake side of the fan 8. Connected to this intake side there is also a pipe 74 which terminates outside the tank 1 and comprises a normal valve 75. The pipe 74 is connected to a normal external water line.

By this means, for example light fabrics can be scoured. To do this the pump 72 draws water from the wash bath in the tank 1 and feeds it through the pipe 73 to the fan 8 which atomizes the water and blows it at high speed through the fabric. During this scouring stage the fabric is made to rotate more slowly than during the fulling stage by raising the known pressing plates (not shown) provided along the fulling channel. On termination of this first stage, water is fed to the fan 8 through the pipe 74, having been taken directly from the outside and therefore clean. During this stage the fan 8 feeds the water onto the fabric, which is therefore rinsed.

It should be noted that during the entire scouring stage the closable slots 11′ of the arched wall 10 are open appropriately to allow the scouring water to pass.

The following modifications fall within the scope of the invention:

a) the shutoff member 20 can consist of a slotted plate slidable along guides and of which the solid portions can overlie the closable slots 11′ of the front wall 10 of the diffuser 9. The plate can be moved by acting on a part associated with the plate, either manually or by a cylinder-piston unit;

b) the shutoff member 20 can also be in the form of a regulator member in that it can close to a greater or lesser extent either all the slots or a fraction of them. Its movement can be controlled either manually or by a motor means of proportional type instead of the two position type (closed or open) such as that described.

Claims

1. A machine for treating fabrics in rope form, comprising a chamber housing a centrifugal fan (8) which draws air from the chamber interior and conveys it into a diffuser (9) situated upstream of a pair of surfaces (for example cylinders 2, 3) which press against the fabric (T) to be treated, the fabric passing over the diffuser (9), to be swollen by the air stream which strikes it from the inside by emerging from apertures (11, 11′) provided in that wall (10) which delimits the diffuser (9) towards the fabric, characterised in that at least a fraction of the apertures (11, 11′) of the wall (10) can be at least partly closed.

2. A machine as claimed in claim 1, characterised by comprising a mobile member (20) which can be moved relative to the wall (10) of the diffuser (9) to at least partly close at least a fraction of the apertures (11, 11′).

3. A machine as claimed in claim 2, characterised in that the mobile member (20) is moved by motor means (21).

4. A machine as claimed in claim 1, characterised in that the motor means are either of the proportional type or the two-position type (21).

5. A machine as claimed in claim 4, characterised in that in the case of two-position motor means (21) the mobile member (20), when in a predetermined position, close apertures (11′) of the wall.

6. A machine as claimed in claim 5, characterised in that the mobile member (20) consists of a grating formed of parallel rods (22) which is

mobile obliquely to the wall (10) of the diffuser (9) away from and towards the apertures (11′) to be closed, so that when in one of its positions it closes the predetermined apertures (11′) whereas when in its other position it lies in correspondence with the solid parts (R) between the apertures (11, 11′).

7. A machine as claimed in claim 1, characterised by comprising, connected to the intake side of the centrifugal compressor (8), means (71, 72, 73) for recirculating scouring liquid.

8. A machine as claimed in claim 1, characterised by comprising, connected to the intake side of the centrifugal compressor (8), means (74, 75) for feeding a flow of water.

9. A machine as claimed in claim 1, characterised in that by varying the positions of the apertures (11′) and feeding scouring solutions into the intake side of the centrifugal compressor (8), it can also be used merely as a scouring machine for fabrics which need no fulling, or to reduce the scouring time for said fulled fabrics.

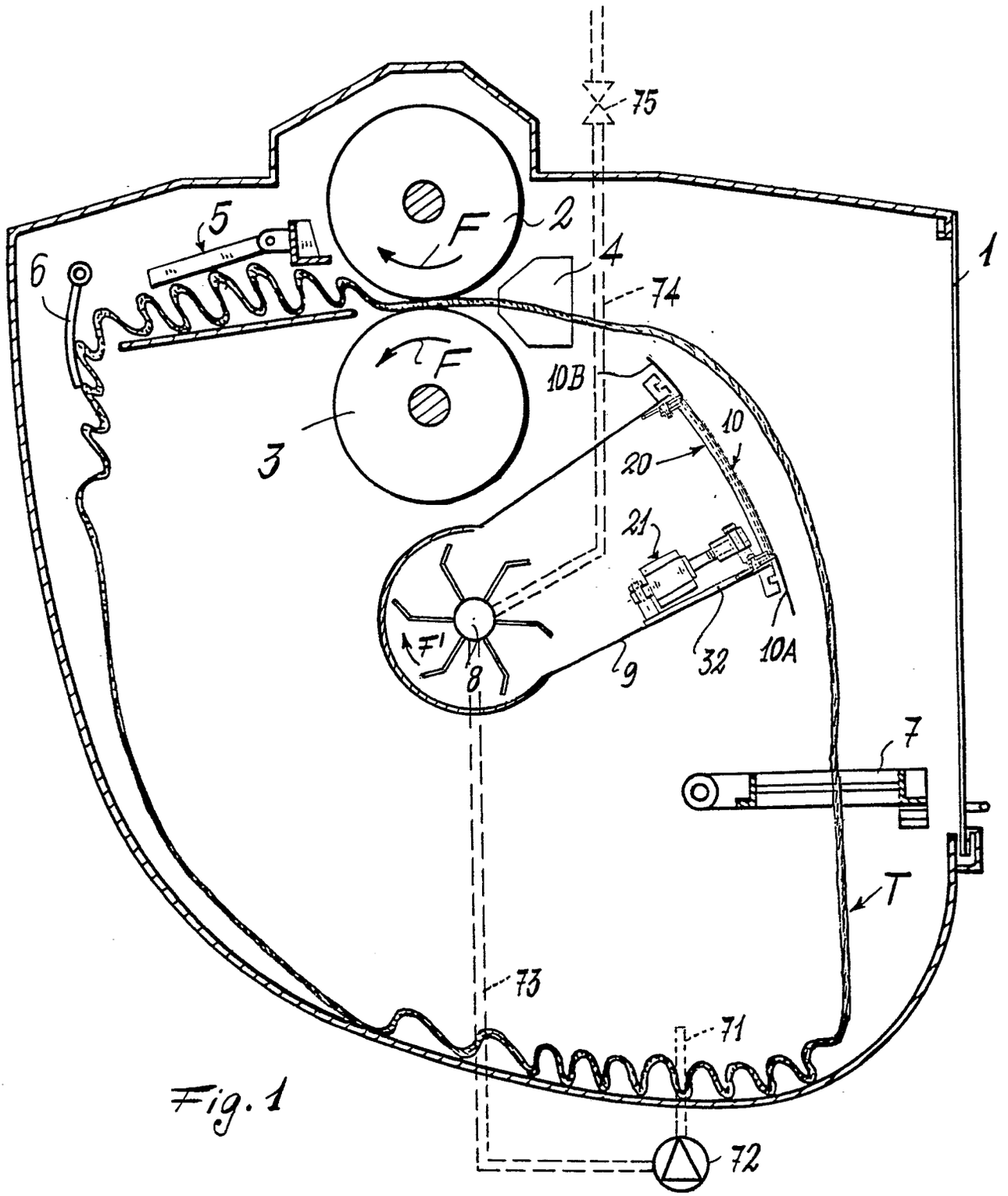

Fig. 1

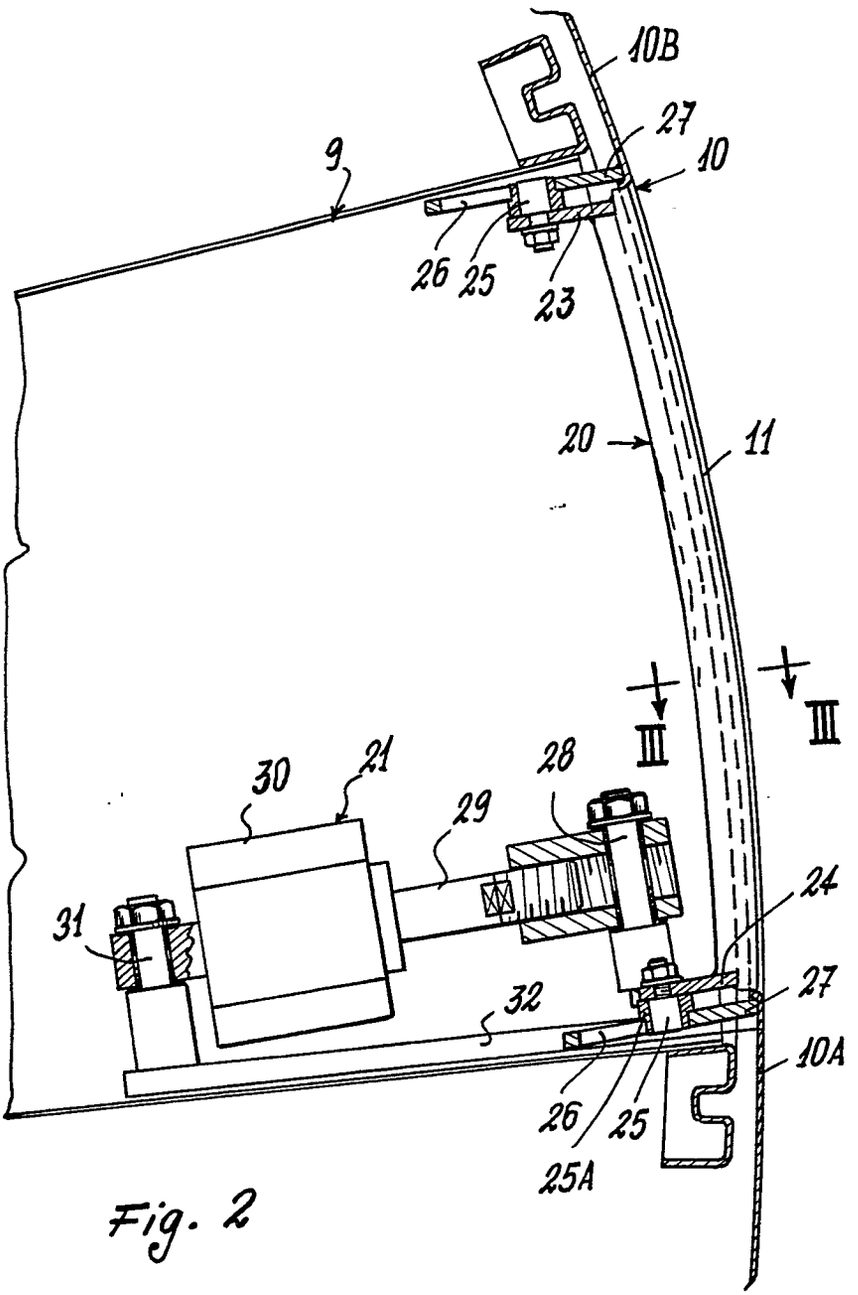
10B
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Fig. 2

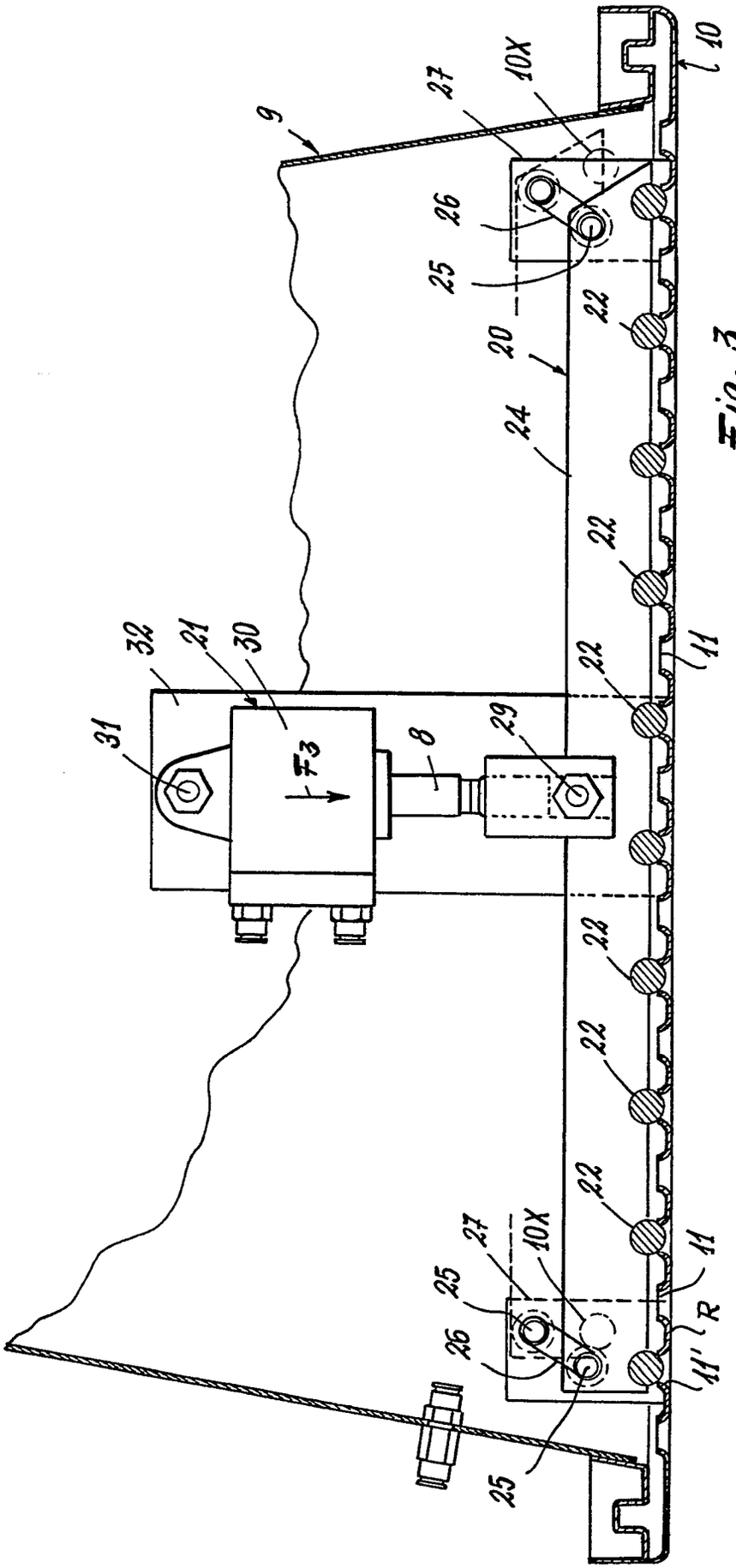

Fig. 3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 89 11 8922

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.5)
A,D	DE-A-3201590 (BERTOLDI) * the whole document *	1	D06C17/02
A	FR-A-2315563 (TEINTURERIE DE CHAMPAGNE)		
A	EP-A-270722 (FAMIT)		
P	EP-A-313498 (SERRACANT-CLERMONT)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

D06C
D06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	09 MARCH 1990	PETIT J.P.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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