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(12) # EUROPEAN PATENT APPLICATION

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(54) **Device to take up lap coming from a drafting group of a drawing frame for cans or bobbins, and a drawing frame for cans or bobbins which employs such a device.**

(57) This invention concerns a device to take up lap coming from a drafting group of a drawing frame for cans or bobbins, the device being suitable for being fitted between a drafting group (17) and a calender (19) and being able to convey and condense the lap (21) so as to obtain a compact sliver (22) substantially free of air, the device having an upper ring (14), a central body coiled in a spiral and a substantially filiform structure.

This invention is also obtained with a drawing frame for cans or bobbins which employs the foregoing device.

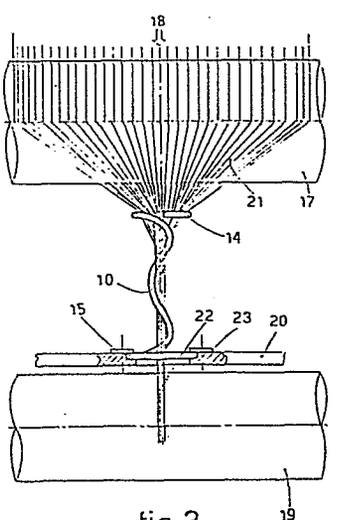

fig.3

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"DEVICE TO TAKE UP LAP COMING FROM A DRAFTING GROUP OF A DRAWING FRAME FOR CANS OR BOBBINS, AND A DRAWING FRAME FOR CANS OR BOBBINS WHICH EMPLOYS SUCH A DEVICE"

This invention concerns a device to take up lap coming from the drafting group of a drawing frame for cans and/or bobbins.

To be more exact, this invention concerns a device to optimize the take-up of the lap of textile fibres coming from the drafting group of a drawing frame, the device being able to convert the lap into a concentrated sliver suitable for filling into cans and/or winding onto bobbins.

The invention also concerns a drawing frame for cans and/or bobbins which employs the device of the invention.

It is known that the assemblage of textile fibres entering the head of a drawing frame is drafted to the desired unit weight by a gripping action of the drafting group.

The drafting group withdraws at high speed the fibres controlled by the head and the fibres leave the drafting group in the form of a lap having the width of the assemblage of fibres entering the group.

The lap is then concentrated into a sliver suitable for filling into cans or winding onto bobbins owing to the action of conveyor-condensers which are normally shaped funnel-wise.

It should be noted that the fibres leaving a drafting group

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at high speed are compelled, for the purpose of being concentrated, to carry out a fast change of direction and therefore of speed before reaching the sliver guide. This change takes place with the help of the conveyor-condenser.

This fast change of direction and speed can cause detachment of the lateral fibres. Indeed, the lateral fibres are the ones least bonded to the others and are the ones which undergo most markedly the effects of the change in speed and direction.

Next, the lateral fibres are the ones which are affected most by the increase in speed due to the longer path which they have to follow.

Lateral detachment of the fibres is still further enhanced by the state of electrification of the fibres themselves and by the return flow of air coming out from the condenser-conveyor, for this flow comes out in the opposite direction to the direction of feed of the lap.

The return flow of air together with the state of electrification of the fibres can be such as to hinder the intake of the fibres themselves, and particularly of the lateral fibres, into the conveyor-condenser or, more simply, into the condenser.

So as to obviate this phenomenon, a plurality of variously arranged holes has been envisaged in the condenser and is able to discharge the air progressively while the latter is leaving the sliver.

The detachment of fibres caused by the foregoing phenomena takes place with the formation of side tufts, which constitute a decline of the quality of the sliver produced.

So as to lessen the formation of the tufts, means have also been introduced which can remove the electrification of the fibres and can enhance dispersion of electrical charges in the fibres.

The means which cause dispersion of the charges, however, tend to cause retention of the fibres, which thus rub against the device dispersing the charges.

Another solution to obviate the foregoing drawbacks is to reduce the outlet speed and therefore, in the final analysis, the output of the machine, but this solution is obviously against the user's interest.

To overcome all these drawbacks, the present author has planned, tested and embodied a new device which is very simple and functional and which can be readily fitted and employed.

This device, which we shall call hereinafter a torsioner, has the purpose of optimizing take-up of the lap and of converting it into a concentrated sliver.

The torsioner imparts a suitable twist to the sliver running within it, and this twist returns along the sliver and is transmitted to the lap, thereby creating a substantially symmetrical take-up triangle coordinated with the state of the lap itself.

Torsioners, in the widest meaning of the word but a meaning which is wrong according to the content provided in the present invention, are known in themselves but are employed to overcome other problems for other purposes.

The spiral-wise devices about which a sliver or roving is wound are normally employed for transmitting twists able to impart a given strength (see DE OS 1.510.512, for example).

This enables a stronger sliver to be obtained which is not damaged if it is compelled to run over a long path (see DE OS 1.785.481, for instance) or a different course, such as being wound onto bobbins (see FR 1.528.078 and FR 2.508.940, for instance).

The problem, however, which the present author tends to overcome is obviously different since it tends towards the compaction of the sliver with means other than those normally

used to overcome a whole set of drawbacks,as indicated clearly above.

According to the invention the torsioner consists of a substantially filiform element shaped with a helix and with a central body having an inner diameter suitable for the passage of the sliver of fibres.

The present author has found that, if the fibres are not to be harmed too much, the helix of the coil of the torsioner should have an angle of between 15° and 40° and advantageously about 30°.

One or more parts of the torsioner can consist wholly or partly of a ceramic material or of a material able to resist wear. Its intake consists of an opened ring having a suitable diameter and able to collect the lap leaving the drafting group into the torsioner.

The gap in the ring has the purpose of enabling the sliver to be introduced into the bore of the torsioner and of facilitating insertion between the drafting rollers and the calender.

The lap coming from the drafting rollers begins to be concentrated when it enters the intake ring and, thereafter, the bore of the torsioner.

The lap is thus compelled by the helix to accept the twist imparted by the helix itself. This twist returns along the lap and obliges it to take up a substantially triangular shape immediately upstream from the torsioner.

This triangular shape bonds by torsion the fibres which compose the lap, and converts the latter into a twisted sliver.

This triangular assemblage formed by twisting the lap raises the speed of formation of the lateral edges to values 15-35% higher, together with an equivalent increase of output.

The present author has found that, depending on the unit

weight of the lap, the inner diameter of the helix can range from 7 - 9mm. down to 1.5 - 2 mm. for lower unit weights.

It has also been found that the height of the torsioner can stay substantially constant, whereas the other geometric characteristics of the torsioner can be varied so as to make it suitable for the various unit weights of the lap and the various requirements of the fibres.

The invention is therefore embodied with a device to take up the lap coming from a drafting group of a drawing frame for cans or bobbins, the device being suitable for being fitted between a drafting group and a calender and being able to convey and condense the lap so as to obtain a sliver of desired characteristics, whereby the device has an upper ring, a central body coiled in a spiral and a substantially filiform structure.

The invention is also obtained with a drawing frame for cans and/or bobbins which employs the foregoing device.

Let us now see a preferred embodiment of the invention with the help of the attached figures, which are given as a non-restrictive example and wherein:-

Fig.1 shows a torsioner according to the invention;

Fig.2 shows an application of a torsioner;

Fig.3 shows an application of a torsioner where the lap is wide;

Figs.4 and 5 show different applications of a torsioner with slivers of different widths.

In the figures a torsioner 10 consists of a metallic element or central metallic body 10 conformed substantially with a spiral.

The torsioner has a height which, as the present author has found, can vary from 60 to 120 mm., a height of about 85 - 90 mm. being advantageous according to experiments, provided that the other operating characteristics remain constant.

Next, the torsioner has a central helix with a pitch 12 which can vary between 40 and 80 mm., but it has been found best that the pitch of the helix should be about 60 mm.

Depending on the unit weight of the lap, the torsioner can have an inner diameter 13 of its helix varying from 1.5 - 2 mm. in the case of slivers with a unit weight of about 2.5 - 3 grams per metre up to 7 - 9 mm. or more in the case of slivers with a unit weight of 30 - 35 or more grams per metre.

As we said earlier, the intake portion of the torsioner consists of an upper ring 14 which can be opened and which has a diameter to suit the dimensions of the lap.

If the ring 14 is opened, it has a gap suitable for facilitating the introduction of the lap into the helix formed by the central body of the torsioner after the lap itself has been inserted between drafting cylinders 17 and a calender 19.

As can be seen in Fig.2, a lap 21 leaving the drafting cylinders 17 is introduced into the torsioner 10 and is then made to pass through the calender 19.

Before the lap 21 reaches the calender 19, it takes up the conformation of a sliver 22, above all owing to the cooperation of the torsioner 10 with the fibres which compose the lap itself.

The direction of feed 18 of the fibres, as shown in the figures, indicates clearly the path which the fibres themselves follow.

As shown in Fig.2, the lap 21 enters the torsioner 10 and leaves it in the form of a sliver 22 before reaching the calender 19.

The torsioner 10 is borne by a support 16, which serves to hold and anchor a base 15 of the torsioner itself.

The base 15 of the torsioner can be clamped with brackets 23 and can be lodged either in an appropriate support 16 or in a suitably arranged carrying bar 20.

As we said earlier, depending on the lap and on the properties of the lap and fibres, the dimensions of the opened ring 14 can vary; likewise the dimensions of the central body and its pitch and also the height of the torsioner can vary, these factors being linked to the technical properties of the lap, to the type of the fibres, to the properties of the resultant sliver and to the machine to which the torsioner is fitted.

Moreover, the torsioner 10 can be made of steel or can have a steel core lined with ceramics or can consist of another material suitable for resisting the forces of abrasion and friction caused by the fibres passing through.

Furthermore, the torsioner can be made of wire of a suitable diameter wound and shaped or can be made by casting or by another means, always provided that it complies with the concept that the torsioner should take up a substantially filiform conformation in the tracts which cooperate with the lap or sliver.

According to the invention the zone of contact between the torsioner 10 and the lap 21 or sliver 22 should have a radius of between 1.5 mm. and 5 mm., a radius greater than 2.5 mm. having been found to be advantageous.

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INDEX

10 - torsioner
11 - height of the torsioner
12 - pitch of the torsioner
13 - inner diameter of the helix
14 - opened ring
15 - base
16 - support
17 - drafting cylinders
18 - direction of feed
19 - calender
20 - carrying bar
21 - lap
22 - sliver
23 - bracket

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CLAIMS

1 - Device to take up lap coming from a drafting group of a drawing frame for cans or bobbins, the device being suitable for being fitted between a drafting group (17) and a calender (19) and being able to convey and condense the lap (21) so as to obtain a compact sliver (22)substantially free of air, the device being characterized by having an upper ring (14), a central body coiled in a spiral and a substantially filiform structure.

2 - Device to take up lap coming from a drafting group of a drawing frame for cans or bobbins as claimed in Claim 1, wherein the upper ring (14) is an opened ring.

3 - Device to take up lap coming from a drafting group of a drawing frame for cans or bobbins as claimed in Claim 1 or 2, wherein the height (11) of the device (10) is between 60 and 120 mm. and is advantageously about 85 to 90 mm.

4 - Device to take up lap coming from a drafting group of a drawing frame for cans or bobbins as claimed in any claim hereinbefore, wherein the inner diameter (13) of the spiral formed by the central body of the device (10) ranges from 1.5 to 9 mm. to suit the unit weight of the sliver (22).

5 - Device to take up lap coming from a drafting group of a drawing frame for cans or bobbins as claimed in any claim hereinbefore, wherein the spiral of the device (10) has a pitch (12) which may vary between 40 and 80 mm. but which is advantageously about 60 mm.

6 - Device to take up lap coming from a drafting group of a drawing frame for cans or bobbins as claimed in any claim hereinbefore, wherein the zone of contact between the device (10) and the lap (21) or sliver (22) should have a filiform conformation with a radius of between 1.5 and 5 mm., a radius at least greater than 2.5 mm. being advantageous.

7 - Drawing frame for cans or bobbins which employs a device

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according to any of the claims hereinbefore.

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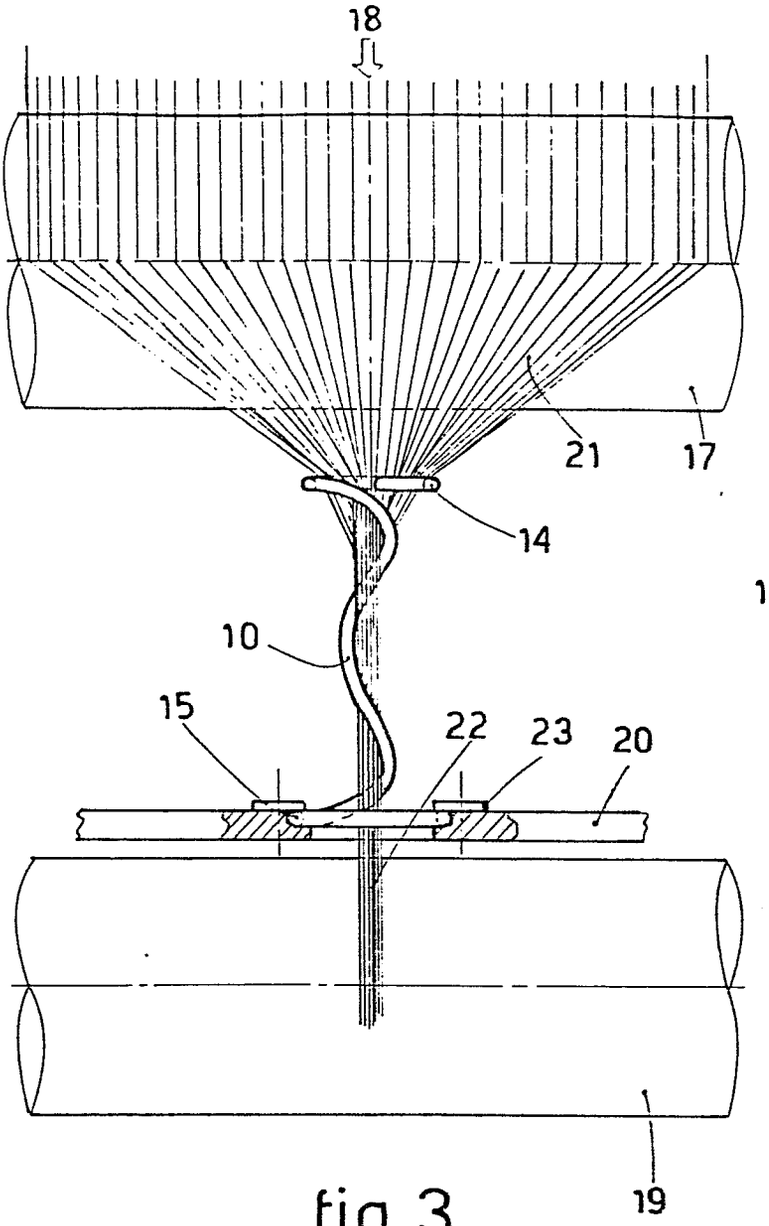

fig.3

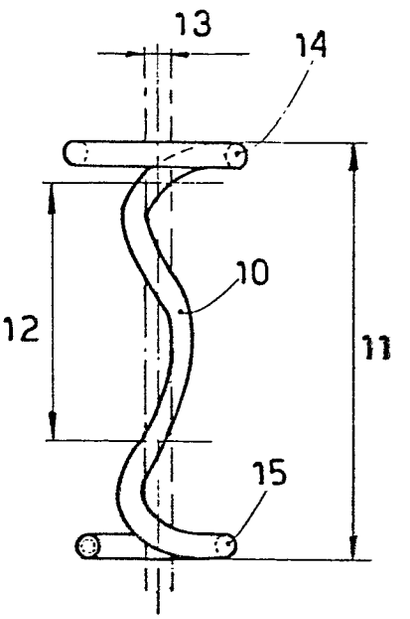

fig.1

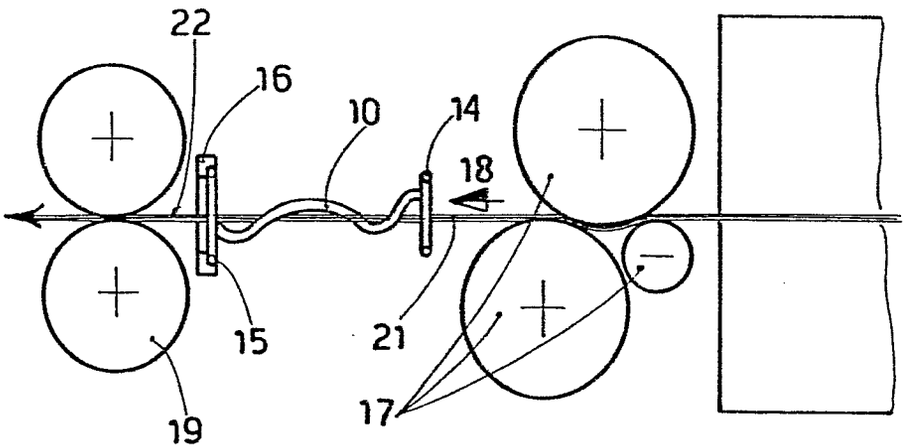

fig.2

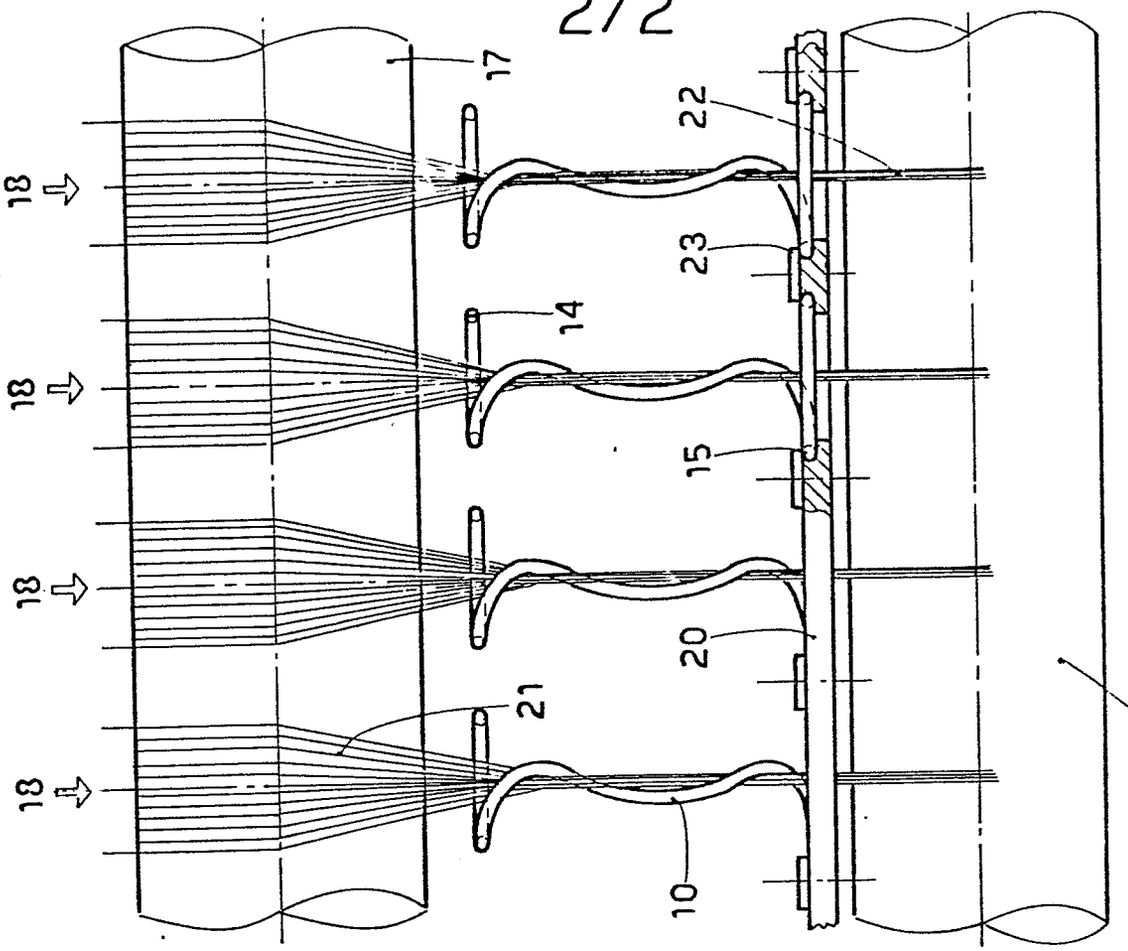
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fig.5

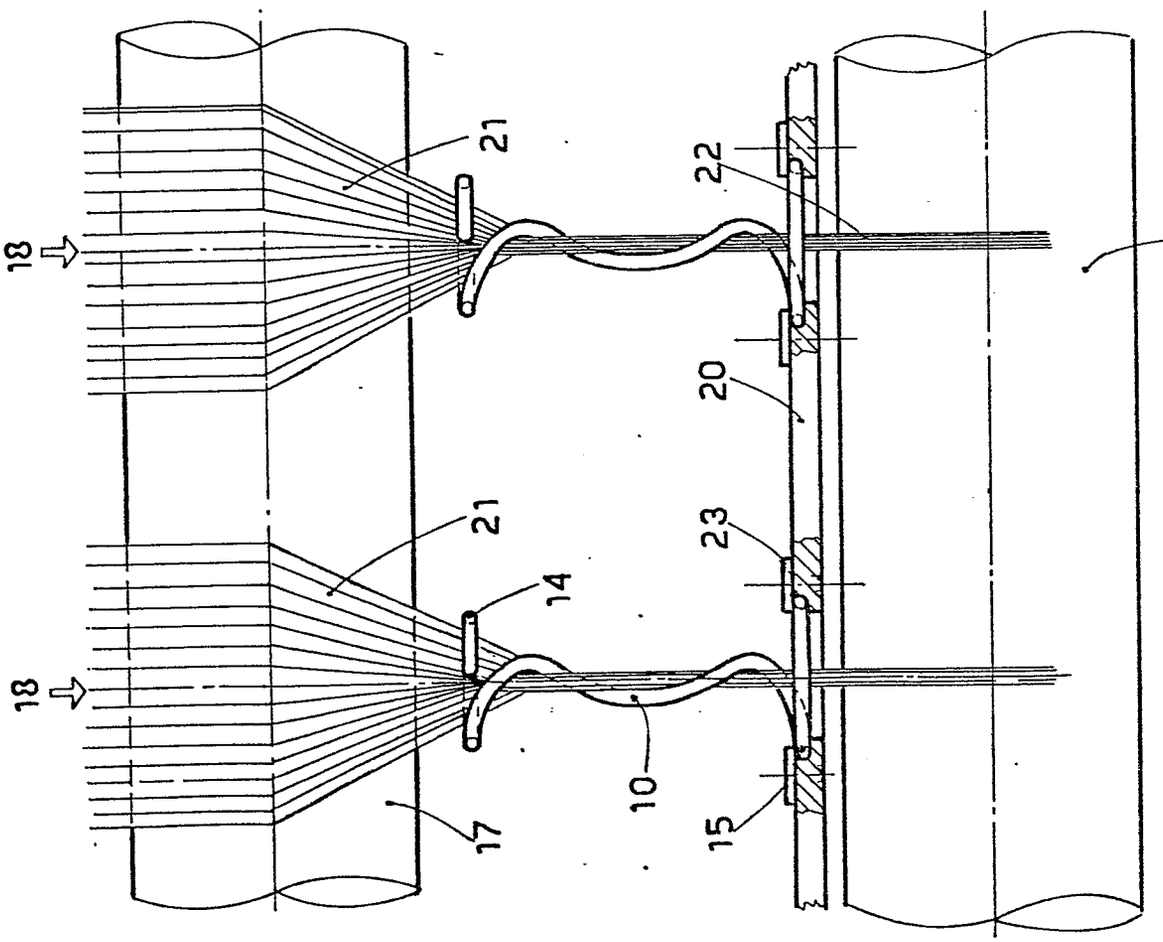
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fig.4

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EUROPEAN SEARCH REPORT

0123341 Application number

EP 84 20 0463

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)
D,X	DE-A-1 510 512 (BIELSKA FABRYKA MASZYN WLOKIENNICZYCH) * Whole document *	1,3,5	D 01 H 7/92
D,X	DE-A-1 785 481 (PRZEDZALNIE BAWELNY IM. GENERALA) * Whole document *	1,2,7	
D,A	FR-A-2 508 940 (SANT'ANDREA NOVARA OFFICINE MECCANICHE E FONDERIE SpA) * Page 2, lines 20-35; page 3, lines 1-9; figures 1-4 *	1,2,7	
A	GB-A-1 496 654 (I.W.S. et al.)		
D,A	FR-A-1 528 078 (N. SCHLUMBERGER & CIE)		TECHNICAL FIELDS SEARCHED (Int. Cl. ³) D 01 H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26-07-1984	MUNZER E.

CATEGORY OF CITED DOCUMENTS

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