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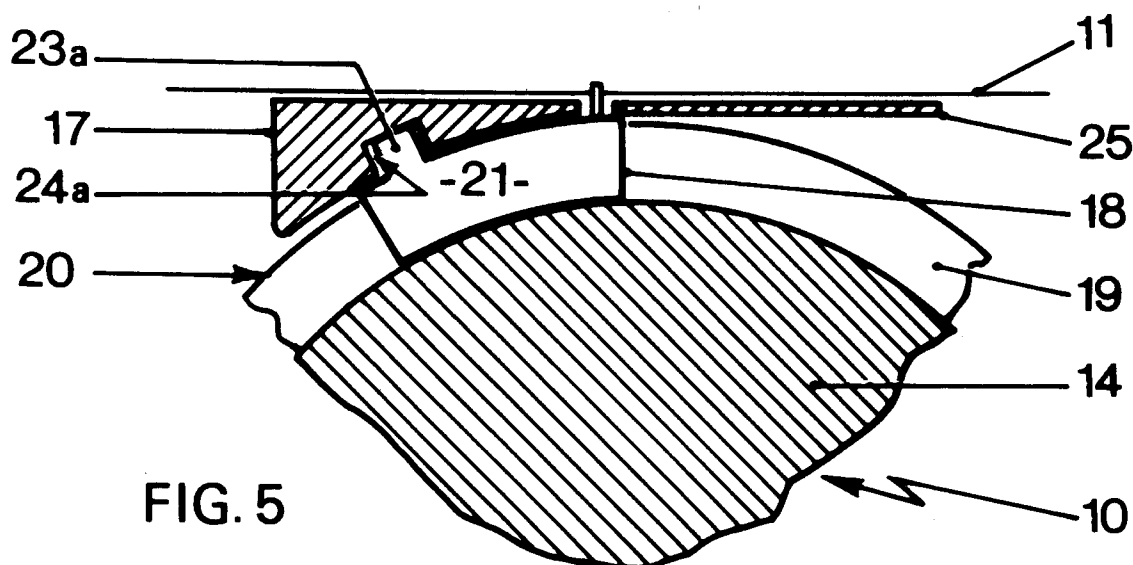
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Macclesfield Cheshire, SK11 0DF(GB)(54) **Winding apparatus.**

(57) A winding apparatus (10), which comprises an elongate roll (14) with a double helical endless groove (19) in the cylindrical surface (20) thereof in which a yarn guide device (18) slides under the constraint of a guide rail arrangement (17) to traverse a path parallel with the axis (15) of the roll (14), is characterised by the yarn guide device (18) having a yarn guide (22) and a guide formation (23) at spaced locations on a follower part (21) which slides in the groove (19). The guide formation (23)

may be a guide post (23a) which cooperates with a pair of guide rails (17a or 17b) or a groove (24a) in the underside of the guide rail (17), or a slot (23b) in the follower part (21) which cooperates with a rib (24b) on the underside of the guide rail (17). With such apparatus (10) the tendency for the yarn guide device (18) to tilt in the groove (19) of the roll (14) is considerably reduced so as to reduce wear, and there is a reduced risk of contamination of the yarn (11) by guide rail (17) lubrication.

**FIG. 5****EP 0 489 501 A1**

This invention relates to winding apparatus, and in particular to apparatus for traversing a running yarn to and fro in a direction parallel with the axis of a package on which that yarn is being wound.

One form of such winding traverse apparatus comprises a roll, and a yarn guide device. The roll is mounted in a textile machine so as to be adjacent a package on which the running yarn is being wound, and to be rotatable about an axis which is parallel with the axis of that package. The roll has an endless groove in its cylindrical surface in the form of a double helix, and the yarn guide device has a follower part located in the groove, a guide post mounted on the follower part and constrained between two spaced guide rails extending parallel with the axis of the roll and package, and a yarn guide mounted on the guide post. Rotation of the roll causes the yarn guide device to move to and fro between the guide rails. Such an arrangement has been used on many textile machines on which yarn packages are wound, for very many years.

However, since the centre of gravity of such a yarn guide device is offset from the follower part, and the yarn tension forces on the yarn guide device are even further from the follower part, there is a tendency for the yarn guide device to tilt in the roll groove, with consequential uneven wear on the follower part. It is therefore necessary to replace the yarn guide device at relatively frequent intervals. In addition the wear can be accelerated, and the traversing motion of the yarn guide device impeded, by bits of yarn and other debris falling between the two guide rails and into the groove in the roll. Furthermore any lubrication of the guide rails and guide post can readily contaminate the running yarn.

It is an object of the present invention to provide a winding apparatus of the above described type, in which the aforementioned disadvantages are avoided or minimised.

The invention comprises a winding apparatus comprising an elongate roll having an endless guide formation on the cylindrical surface thereof, guide means disposed adjacent the roll and extending longitudinally thereof, and a yarn guide device, wherein the yarn guide device comprises an elongate follower part adapted to slide longitudinally of the roll guide formation, a yarn guide mounted on the follower part at one end thereof, and a follower guide formation on the follower part at the other end thereof, the follower guide formation being adapted to cooperate with the guide means to constrain the movement of the yarn guide device in a direction parallel with the guide means.

The guide means may be disposed to extend substantially parallel with the axis of the roll. The

roll guide formation may comprise an endless groove formed in the cylindrical surface of the roll, and may be of a double helical form. The follower guide formation may comprise a guide post mounted on the follower part, in which case the guide means may comprise a pair of spaced, parallel guide rails between which the guide post is disposed, or may comprise a guide rail having a cooperating formation therein in the form of an elongate groove extending along the guide rail. Alternatively the follower guide formation may comprise a slot extending laterally of the follower part, in which case the guide means may comprise a guide rail having a cooperating formation thereon in the form of an elongate rib extending along the guide rail. The cooperating formation may be on the underside of the guide rail.

The follower part may be of a moulded plastics material, and the yarn guide may be of a ceramic material.

The invention will now be further described with reference to the accompanying drawings in which :-

Fig 1 illustrates one embodiment of winding apparatus in accordance with the invention.

Fig 2 illustrates one embodiment of yarn guide device.

Fig 3 illustrates a second embodiment of yarn guide device.

Fig 4 is a transverse section through a part of a winding apparatus similar to that of Fig 1, incorporating a yarn guide device of Fig 2.

Fig 5 is a transverse section through a part of the winding apparatus of Fig 1, also incorporating a yarn guide device of Fig 2, and

Fig 6 is a transverse section through a part of the winding apparatus of Fig 1, incorporating a yarn guide device of Fig 3.

Referring now to Fig 1, there is shown a winding apparatus 10 which serves to wind a running yarn 11 onto a package 12 mounted in a textile machine 13 of which the winding apparatus 10 forms a part. The winding apparatus 10 comprises an elongate roll 14 mounted with its axis 15 parallel with the axis 16 of the package, a guide means 17 disposed adjacent the roll 14 and extending longitudinally thereof, and a yarn guide device 18. The guide means 17 is in the form of a rail extending substantially parallel with the axes 15, 16 of the roll 14 and package 12.

The roll 14 has an endless guide formation 19 in the form of a double helical groove formed in the cylindrical surface 20 of the roll 14. The yarn guide device 18 comprises an elongate follower part 21, preferably of a moulded plastics material, a yarn guide 22 of a ceramic material mounted on one end of the follower part 21 and a follower guide formation 23 at the other end of the follower part

21, as is more clearly shown in Figs 2 to 6. In the embodiment of Fig 2 the follower guide formation 23 is in the form of a guide post 23a, whereas in the embodiment of Fig 3 the follower guide formation 23 is in the form of a slot 23b extending transversely of the follower part.

In both embodiments the follower part 21, in plan view, of "boat" shaped or oval form so as to enable its orientation in the roll groove 19 to alter smoothly as the end of a traverse stroke is reached and the groove 19 changes from one helix to a helix in the opposite direction.

As the roll 14 rotates, the reaction between the walls of the groove 19 and the follower part 21 causes the yarn guide device 18 to move. Such movement is constrained to be in a direction parallel with the guide means 17 by virtue of the reaction between the follower guide formation 23 and the guide means 17. In the embodiment of Fig 4 the follower guide formation 23 in the form of a guide post 23a is disposed between two spaced, parallel guide rails 17a, 17b which form the guide means 17. In the embodiment of Fig 5 the follower guide formation 23 in the form of a guide post 23a is located within a cooperating formation 24 in the form of an elongate groove 24a extending along the single guide rail 17. In the embodiment of Fig 6 the follower guide formation 23 in the form of a transverse slot 23b has located therein a cooperating formation 24 in the form of an elongate rib 24b extending along the single guide rail 17. With all of the embodiments described above the centre of gravity of the yarn guide device 18 is close to the mid-height of the follower part 21. In addition the forces acting on the yarn guide 22 due to the tension in the running yarn 11 are close to the follower part 21. In consequence the tendency of the yarn guide device 18 to tilt under the action of the forces acting on it is considerably less than is the case of the prior known yarn guide devices in which the relatively heavy ceramic yarn guide 22 is mounted on top of the guide post 23. This reduced tendency to tilt causes a reduction in the uneven wear of the follower post which is characteristic of the prior known yarn guide devices. Furthermore lubrication of the guide rail 17 and follower guide formation 23 is less likely to contaminate the yarn 11 with the devices 18 of the present invention than is the case with the prior known yarn guide devices. Particularly in the case of the embodiment shown in

Fig 5, there is a reduced tendency for bits of yarn and other debris to impede the motion of the yarn guide device 18 compared with the previously known devices. To further reduce the tendency for such debris to fall into the groove 19, a shield 25 may be disposed as shown in Fig 5, in addition to the shielding effect provided by the guide rail 17.

Other embodiments of winding apparatus in accordance with the invention will be readily apparent to persons skilled in the art. For example the endless guide formation on the cylindrical surface of the rail may be in the form of a rib, and the yarn guide device may then be formed as a "saddle" mounted on the rib.

Claims

1. A winding apparatus comprising an elongate roll having an endless guide formation on the cylindrical surface thereof, guide means disposed adjacent the roll and extending longitudinally thereof, and a yarn guide device, wherein the yarn guide device comprises a follower part adapted to slide longitudinally of the roll guide formation and a follower guide formation is adapted to cooperate with the guide means to constrain the movement of the yarn guide device in a direction parallel with the guide means, characterised in that a yarn guide (22) is mounted on the follower part (21) at one location, and the follower guide formation (23) is provided on the follower part (21) at a second location spaced from the one location.
2. A winding apparatus according to claim 1, wherein the follower part is elongate, characterised in that the one location is at one end thereof and the second location is at the other end thereof.
3. A winding apparatus according to claim 1 or claim 2, characterised in that the roll guide formation (19) comprises an endless groove of a double helical form formed in the cylindrical surface (20) of the roll (14).
4. A winding apparatus according to any one of claims 1 to 3, wherein the follower guide formation comprises a guide post mounted on the follower part, characterised in that the guide means (17) comprises a guide rail having a cooperating formation (24) in the form of an elongate groove (24a) extending along the guide rail (17) and adapted to accommodate the guide post (23a) therein.
5. A winding apparatus according to any one of claims 1 to 3, characterised in that the follower guide formation (23) comprises a slot (23b) extending laterally of the follower part (21).
6. A winding apparatus according to claim 5, characterised in that the guide means (17) comprises a guide rail having a cooperating

formation (24) in the form of an elongate rib (24b) extending along the guide rail (17) and adapted to be received in the slot (23b).

7. A winding apparatus according to claim 4 or claim 6, characterised in that the cooperating formation (24) is on the underside of the guide rail (17) adjacent the roll (14).

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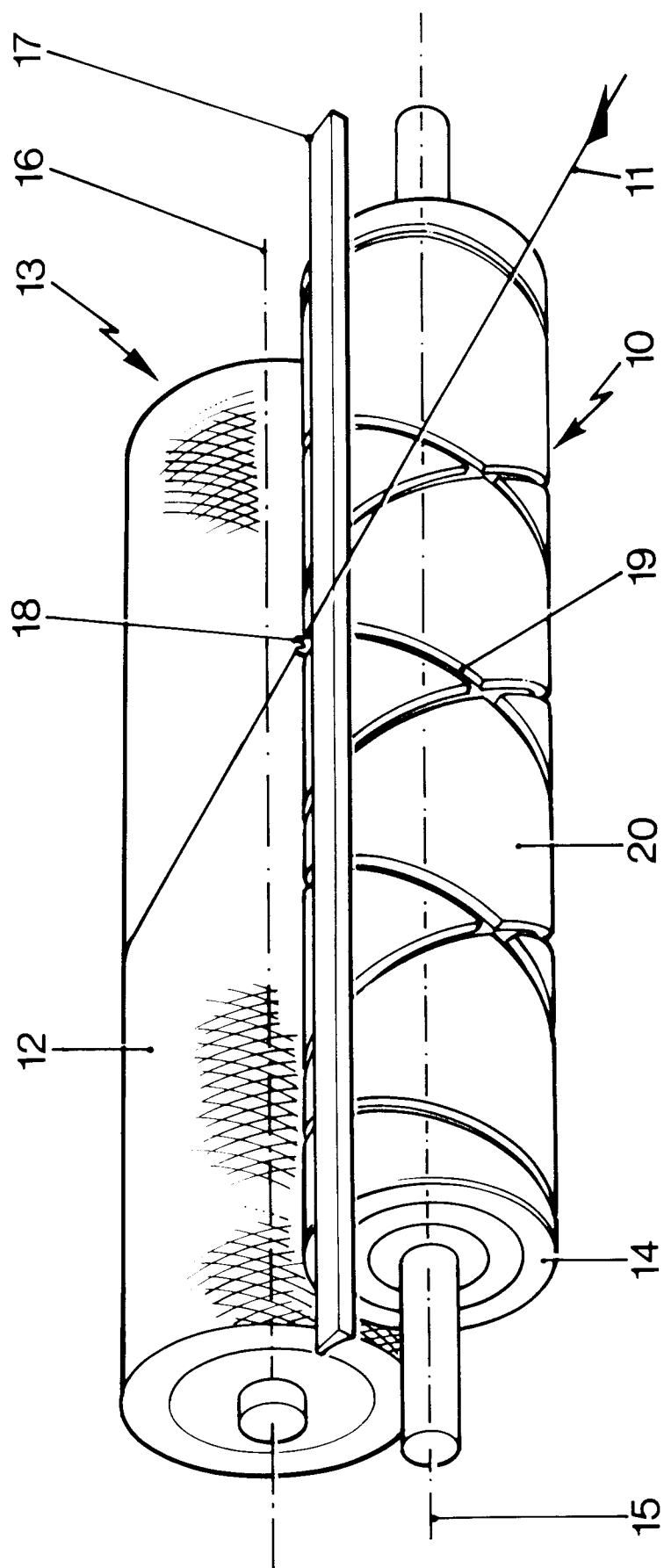
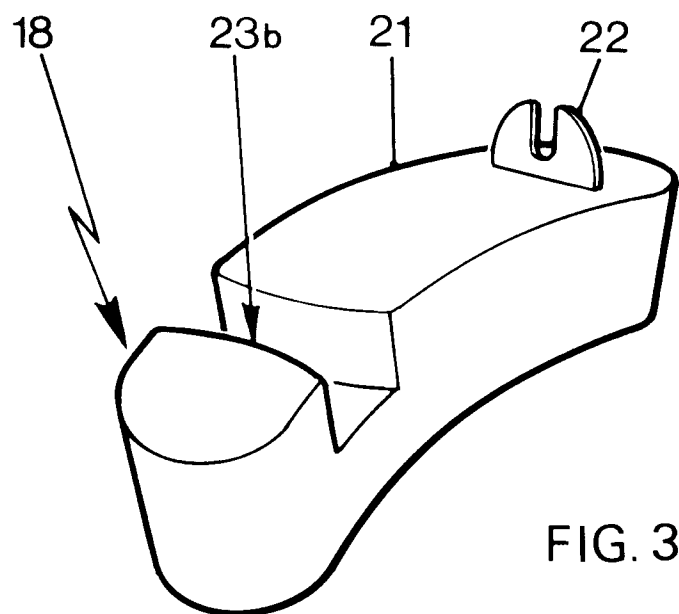
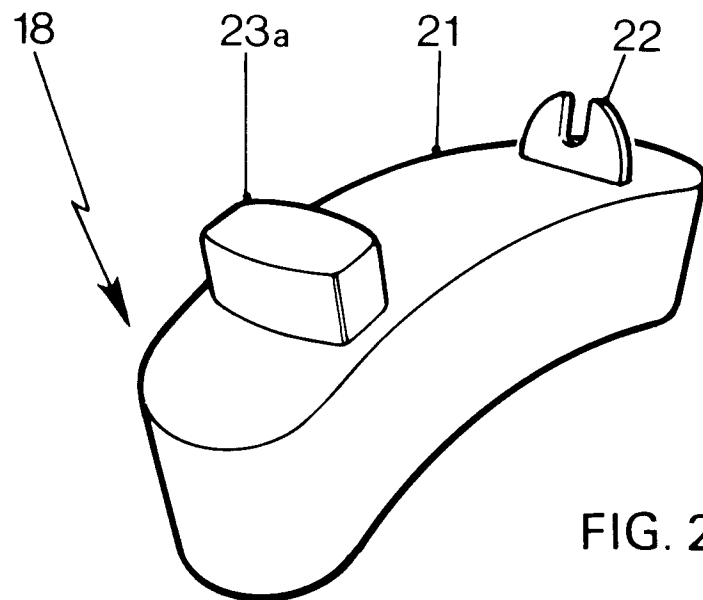
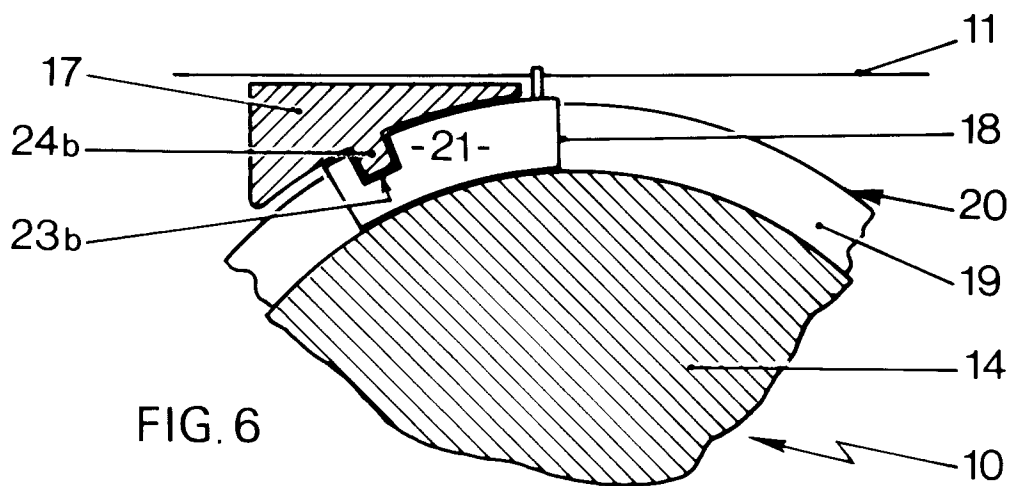
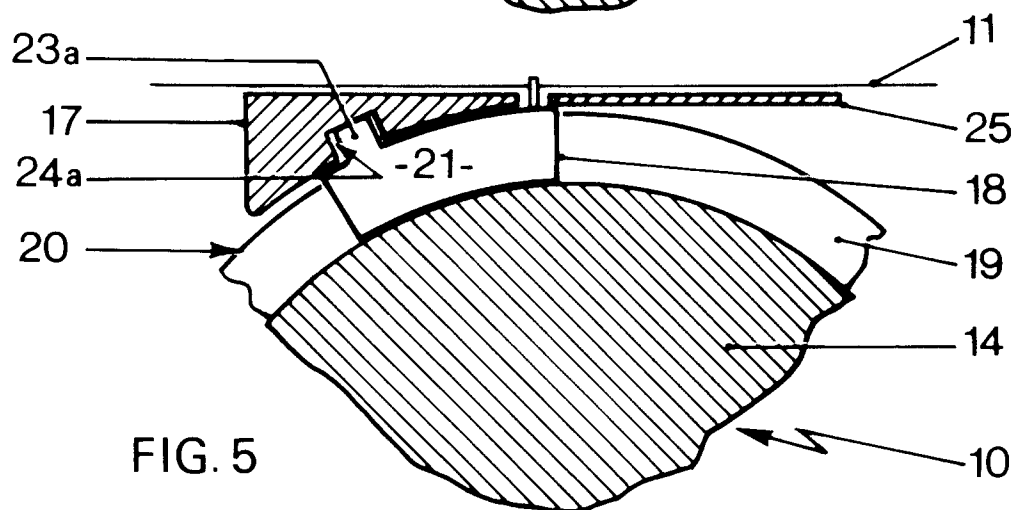
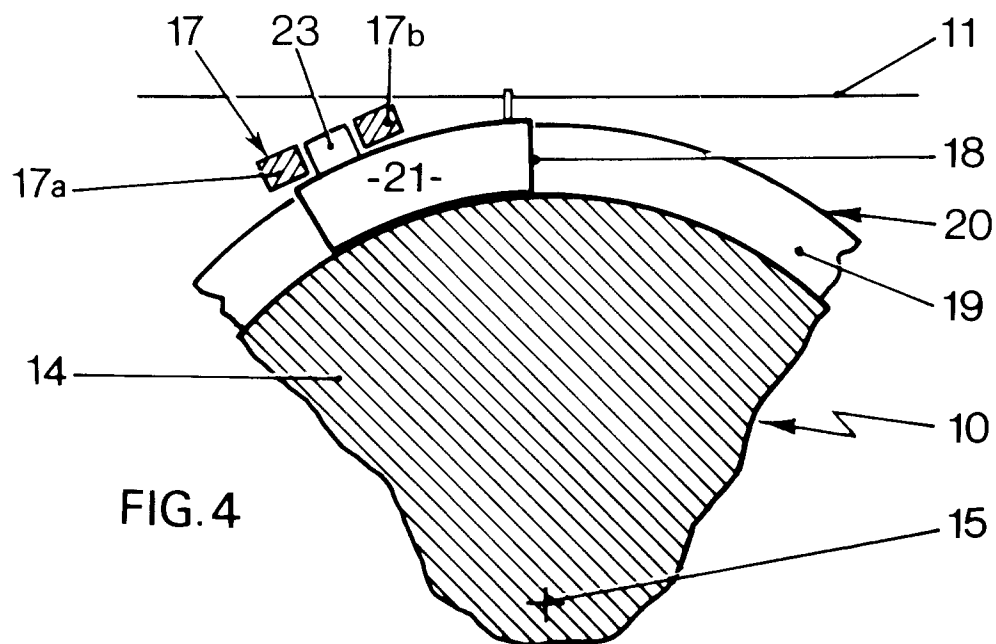


FIG.1







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EUROPEAN SEARCH REPORT

Application Number

EP 91 31 0221

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)
X	DE-A-4 006 876 (MURATA KIKAI K.K.) * column 8, line 24 - line 61; figures 9,10 * ---	1-4,7	B65H54/28
A	US-A-3 964 724 (FISHER ET AL.) * column 3, line 23 - line 30; figure 1 * ---	1,5,6	
A	EP-A-0 213 462 (BARMAG BARMER) * figures 1-3 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65H
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27 MARCH 1992	Examiner TAMME H. -M. N.
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