

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) Publication number:

0 475 485 A1

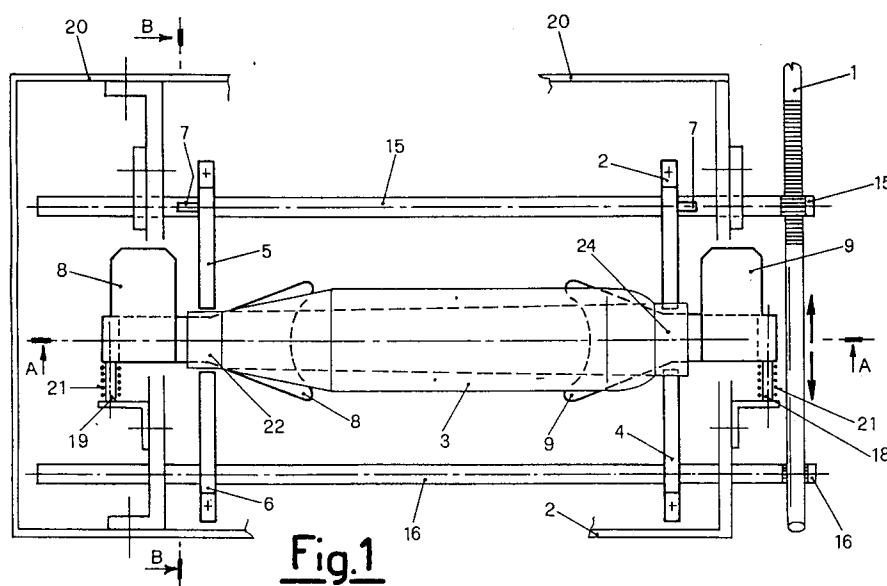
(12)

EUROPEAN PATENT APPLICATION(21) Application number: **91202090.6**(51) Int. Cl.⁵: **B65H 67/06**(22) Date of filing: **15.08.91**(30) Priority: **29.08.90 IT 2133090**(43) Date of publication of application:
18.03.92 Bulletin 92/12(84) Designated Contracting States:
CH DE FR GB LI(71) Applicant: **SAVIO S.p.A.**
Via Udine 105
I-33170 Pordenone(IT)(72) Inventor: **Badiali, Roberto**
Via Carducci, 1/A
I-33170 Pordenone(IT)
Inventor: **Ouaia, Amedeo**
Via Ceolini 70
I-33080 Porcia, Pordenone(IT)(74) Representative: **Henke, Erwin et al**
Ing.Barzanò & Zanardo Milano S.p.A. Via
Borgonuovo, 10
I-20121 Milano(IT)(54) **Device for positioning textile cops according to the end of their tapered bobbins.**

(57) The present invention relates to a device for positioning textile cops according to the end of their tapered bobbins, which are full of wound thread, the said device including several integrated operating units:

- a unit comprising cams in the form of sectors of a circle positioned frontally in pairs at the ends of the housing of the cop to be positioned;

- a unit comprising two supporting flyers, one for each end of the cop to be positioned;
- a single kinematic mechanism which rotates the front pairs of cams angularly and also imposes a downward rotary thrust, overcoming the elastic action of a spring, on one of the two said supporting flyers, which is located at the the larger-diameter end of the tapered cop bobbin.

**Fig.1****EP 0 475 485 A1**

The present invention relates to a device for positioning textile cops full of wound thread according to the end of their tapered bobbins onto which the thread is wound.

In the textiles sector the thread produced in ring spinners, or similar machines, is collected and wound onto rod-shaped tapered bobbins which have different diameters at each end. The accumulation of thread wound onto the bobbins gives rise to the formation of spinning cops, which must be correctly placed and positioned on the automatic loading devices in order to supply the spooling stations. Positioning means that the cops must all be placed in the same direction and consequently the direction of taper of their bobbins must all face in the same direction.

Devices that position spinning cops by means of the different-diameter end of their bobbins are already known and frequently used for the automatic supply of cops along the winding front of spoolers.

Using the said devices merely involves placing the cops on any conveyor belt taking care only that these cops are singularised without bothering to position them according to the direction of taper of their bobbins. There are, in fact, known state-of-the-art devices which pick up the cops individually from the rung belts of the ring spinner, or from a collection bin, and move them onto the said conveyor belt. For simplicity we shall henceforth refer only to bobbins for spinning cops meaning always tapered bobbins, but this shall in no way constitute a limitation. The rod-shaped body of the cop bobbin need not itself be cone-shaped, neither need it be hollow, but merely be of a different diameter at either end.

By way of example some of the known state-of-the-art devices have positioning and straightening elements which are fixed and not movable. In such constructional solutions the detectors of the position of the cop are slots made in plates, or openings between two fixed elements.

Incidentally, the said slots or openings are located at the end of a slide, or in a feed channel, or in a feed well or chamber in order to locate the cop to be positioned on them. The said slots or openings are calibrated with a smaller width than that of the largest diameter of the cop bobbin and with a larger width than that of the smallest diameter of the cop bobbin. Since the cop bobbins have a slight difference between the diameters of their ends, in such a constructional solution, a slight variation in the width of the two slots, or two openings is evident. Clearly, the slightest deformation of the ends of the cop bobbin, or the laceration of one of the end edges of the said bobbin, creates operational jams in the positioning device during the automatic supply stage of the spooling stations.

This results in the interruption of the automatic feed cycle so that a service operator can intervene.

The cost of labour for these emergency operations represents a considerable factor in calculating production costs. Even if reduced by constructional improvements, a hindrance like that described, with the high loading and supply speed reached in current machines, assumes considerable importance due to the delays it causes in the subsequent stages of the cycle. Solutions of this type, moreover, have the drawback that varying the length of the cop and diameters of the ends of its bobbin involves replacing the positioning device with another device suited to the different dimensions. We are therefore dealing with constructional solutions which are rigid in their use.

The main aim of the present invention is therefore to ensure correct operation of the entire stage of supplying cops to the spooling stations, so that the faults and disadvantages connected with current state-of-the-art devices, together with those listed above, are avoided.

An additional aim of the present invention is to provide a device which has a simple constructional structure and is made so that the method of positioning the cops can be carried out quickly and without inconvenience.

Subsequently, for simplicity, the use of the present invention shall be treated as relating to spooling stations, it is understood however that whatever is stated as regards the said spooling stations shall also apply to any other textile working station which requires a device for positioning cops or any other rod-shaped elements for automatic supply, without those differences which distinguish the various types of the said textile working stations affecting the device covered by the invention.

The device covered by the invention in no way alters the operating system and equipment connected with the spooling stations, and so no reference shall be made to the conventional spooling station or to the elements and equipment which enable automatic supply of the cops.

The said elements and equipment, all of known state of the art, are not shown in the Figures since they are not essential to understanding the positioning device described herein.

In accordance with this and the defects and disadvantages mentioned above connected with current state-of-the-art arrangements, the present invention relates to a device for positioning textile cops according to the end of their tapered bobbins in which the said device comprises in operational co-ordination:

- a unit comprising cams in the form of sectors of a circle positioned frontally in pairs at the ends of the housing of the cop to be positioned, and each cam, moreover, has round

its outer edge a strip of sufficiently yielding elastic material;

- a unit comprising two supporting flyers, each located at either at end of the cop to be positioned and on the said flyers the cop itself is housed, and each flyer has a flat top extension element arranged both in a precise angular position and with a precise operating projection;
- a kinematic mechanism which rotates angularly, in perfect synchronism, both front pairs of cams and also imposes in the end part of the said angular rotation a downward rotary thrust on the supporting flyer located at the end of the cop, which has the larger diameter of the wound thread supporting bobbin.

The present invention also relates to a device which in practical operation ensures that the distance between the front cams, of both pairs located at either end of the cop, must be such as to be both considerably less than the larger diameter of the tapered bobbin of the cop and also considerably greater than the smaller diameter of the tapered bobbin of the said cop.

The device for positioning textile cops, for the practical embodiment according to the present invention, also provides that one cam of each front pair has a protruding pin on its outer side and the said pin interferes with the flat top extension element of the flyer that is supporting the corresponding end of the cop, which has the larger diameter of its bobbin.

The device for positioning textile cops, for the practical embodiment according to the present invention, also provides that each supporting flyer pivots on a pin round which it rotates overcoming the elastic action of a spiral spring also located around the said pin.

With reference to the above, in the attached drawings a preferred solution is shown which is not binding or limiting as regards the reciprocal position of the components and the consequent simplifications that could arise therefrom; the said solution shall be described hereafter with reference to the following Figures:

- Fig. 1 is a schematic view from above of the device covered by the present invention, which shows a single cop placed and housed between the front end cams and the supporting flyers below and the said Figure also shows the kinematic mechanism which angularly rotates, in perfect synchronism, both front pairs of cams;
- Fig. 2 is a schematic side view of Fig. 1, along line A-A, and the said view shows that the smaller-diameter end of the cop bobbin rests on the supporting flyer below, while the larger-diameter end of the said cop bobbin

rests between the sectors of a circle of the front cams pressing on their strips of elastic material;

- Fig. 3 is a schematic front view of Fig. 1, along line B-B, and the said view shows the sectors of a circle of the cam which have an outer edge of elastic material;
- Fig. 4 is a schematic top view of the device covered by the present invention which shows the configuration at the moment after the initial angular rotation of the cams, which force the larger-diameter end of the cop bobbin downwards overcoming the elastic force of the supporting flyer below;
- Fig. 5 is a schematic side view of Fig. 4, along line A-A and the said view shows the moment of contact between the protruding pin on the outer side of the cam and the flat top extension element of the supporting flyer;
- Fig. 6 is a schematic front view of Fig. 1, along line B-B and the said view shows the angular rotation of the cams at the end of the first stage, which concludes with contact between the protruding pin of the cam and the flat top extension element of the supporting flyer below;
- Figs. 7, 9 and 11 are schematic side views which show the successive moments between the position of starting to insert the cop between the front end cams and the position of completing rotation of the cams and in the said Figures the cop is housed in an upside down position as compared to the position illustrated in Figure 1;
- Figs. 8, 10 and 12 are schematic front views of Figures 7, 9 and 11 respectively, along line D-D, and the said views show both the initial position of housing the cop and the next moment on completing the first angular rotation of the cams, which concludes with the start of interference contact between the said protruding pin of the cam and the flat top extension of the supporting flyer below and also the moment at which the angular rotation of the cams has ended and the cop is forced to descend in a perfect position;
- Figs. 13, 15 and 17 are schematic side views which represent the successive moments between the position of starting insertion of the cop between the front cams and the position of ending rotation of the cams and in the said Figures the cop is housed in the same position as that shown in Figure 1;
- Figs. 14, 16 and 18 are schematic front views of Figures 13, 15 and 17 respectively, along line C-C, and the said views show both the initial position of housing the cop and the subsequent moment on completing the first

angular rotation of the cams, which concludes with the start of interference contact between the said protruding pin of the cam and the flat top extension of the supporting flyer below and also the moment at which the angular rotation of the cams has ended and the cop is forced to descend in a perfect position

In the Figures the same elements bear the same reference numbers.

Moreover in the Figures, for the sake of clarity of the whole, those parts not necessary for understanding the invention, such as the motorisation centre of the kinematic mechanism which rotates the cams angularly, the various supporting structures and the means of supply and pick-up, are omitted. In the said attached Figures:

1 is the toothed control rack rod which engages with the toothed sections of shafts 15 and 16; 2 and 4 are two cams in the form of sectors of a circle positioned, one opposite the other, at one end of the housing of cop 3 to be positioned. The said cams 2 and 4 are rigidly splined onto shafts 15 and 16; 5 and 6 are the other two cams in the form of sectors of a circle positioned, one opposite the other, at the other end of the housing of cop 3 to be positioned (see Fig. 1); 7 is a protruding pin on the outer side of cams 5 and 2 onto which it is rigidly fixed as a single body; 8 and 9 are the two supporting flyers each located at either end of cop 3 to be positioned and on the said flyers cop 3 is housed; 10 and 12 are the strips of elastic material fixed to the outer edges of sector-of-a-circle cams 5 and 6 respectively; 11 and 14 are arrows indicating the directions of the angular rotations of the cams round shafts 15 and 16; 18 and 19 are surrounded by spiral springs 21 to hold the said flyers in their position supporting cop 3 housed on them; 20 is the outline of the supporting frame of the device covered by the present invention; 22 is the smaller-diameter end of the bobbin of cop 3; 24 is the larger-diameter end of the bobbin of cop 3 and the said end 24 is gripped by the front pair of cams; 23 and 25 are the arrows showing the angular rotations of flyers 9 and 8 around their pins 18 and 19; 9a, 9b and 9c are the outlines of the angular positions of supporting flyer 9 when it is subject to the initial thrust of larger-diameter end 24 and subsequently the end thrust of pin 7 on its flat top element; 26 and 27 are the strips of elastic material fixed to the outer edges of sector-of-a-circle cams 6 and 5 respectively.

The operation of the device according to the present invention is now described.

When a conveyor belt, or similar element, of an appropriate constructional type and known state of the art, is activated, the loading system upstream, of a known type and therefore not described and illustrated herein, will supply a cop singly placing it

carefully between front cams 2 and 4 and front cams 5 and 6. The said cop 3 will also be over supporting flyers 9 and 8. Next, toothed rack rod 1 will be pushed across and engaging with the toothed sections of shafts 15 and 16 will cause the cams rigidly splined onto the said shafts to rotate angularly. The pair of cams that supports the end of cop 3 at the larger-diameter part of bobbin 24 will push the said cop end downwards. In Figures 1 and 13 the cams that grip the end 24 of the bobbin of cop 3 are the front end cams 2 and 4 which, by means of their elastic strips 10 and 12 push cop 3 into the position shown in Figure 15.

Flyer 9 below will assume position 9b, while its flat top part will begin interference contact with pin 7 of cam 2. The next angular rotation of cams 2 and 4 will push pin 7 to cause flyer 9 to rotate into position 9c, as is shown in Figures 17 and 18.

Consequently, cop 3 will have the support of flyer 9 withdrawn from its end 24, so that cop 3 rotates falling by gravity around the single support constituted by the other flyer 8. The said cop 3 falling downwards will move on vertically into the feed well or channel (not drawn), due solely to its own weight, so that the larger-diameter end 24 will be at the bottom and the smaller-diameter end 22 at the top (see Fig. 17). Immediately afterwards the reverse crosswise thrust of toothed shaft 1 is activated, which re-establishes the initial configuration of the device, waiting to receive and house the next cop to be positioned.

It is doubtless clear that due to the symmetrical arrangement of the elements described and the parts of the device covered by the present invention and the operation of the device, cop 3 is made upright with its larger-diameter end 24 downwards even if the latter is resting on flyers 8 and 9 with the ends inverted as compared to the position shown in Figures 1 and 13 and described above. In Figures 7, 9 and 11, in fact, cop 3 is upside down as compared to the above-described position. The operating stages for positioning cop 3 can be easily understood due to the perfect correspondence described above. Consequently, further description of the operating stages in the case of a cop 3 picked up and housed with the ends as illustrated in Figure 7, which shows a position which is upside down as compared to that shown in Figure 13, is therefore superfluous.

It is merely by way of example that movement of the cams through a rack rod has been envisaged, since similar kinematic mechanisms may be envisaged; various detailed modifications to the form of embodiment of the supporting flyers and interference pins protruding from the cams and their method of fixing may also be envisaged without going beyond the scope of this invention.

Claims

spring also located around the said pin.

1. A device for positioning textile cops according to the end of their tapered bobbins, which are full of wound thread, characterised in that it includes several integrated operating units:
 - a unit comprising cams in the form of sectors of a circle and the said cams are positioned frontally in pairs at the ends of the housing of the cop to be positioned;
 - a unit comprising two supporting flyers, each located at either end of the cop to be positioned, and on the said flyers the cop is housed;
 - a kinematic mechanism which rotates both front pairs of cams angularly, in perfect synchronism, and also imposes in the end part of the said angular rotation a downward rotary thrust on the supporting flyer located at the end of the cop, which has the larger diameter of the wound thread supporting bobbin.
2. A device for positioning textile cops according to Claim 1, characterised in that each cam in the form of sectors of a circle has round its outer edge a strip of sufficiently yielding elastic material;
3. A device for positioning textile cops according to Claims 1 and 2, characterised in that the distance between the front cams, or both pairs located at either of the said ends, must be such as to be both considerably less than the larger diameter of the tapered bobbin of the cop and also considerably greater than the smaller diameter of the tapered bobbin of the said cop.
4. A device for positioning textile cops according to Claim 1, characterised in that each supporting flyer has a flat top extension element arranged both in a precise angular position and with a precise operating projection.
5. A device for positioning textile cops according to Claim 1 and any one of the previous Claims, characterised in that one cam of each front pair has a protruding pin on its outer side and the said pin interferes with the flat top extension element of the flyer that is supporting the corresponding end of the cop which has the larger diameter of its tapered bobbin.
6. A device for positioning textile cops according to Claims 1 and 4, characterised in that each supporting flyer pivots on a pin round which it rotates overcoming the elastic action of a spiral

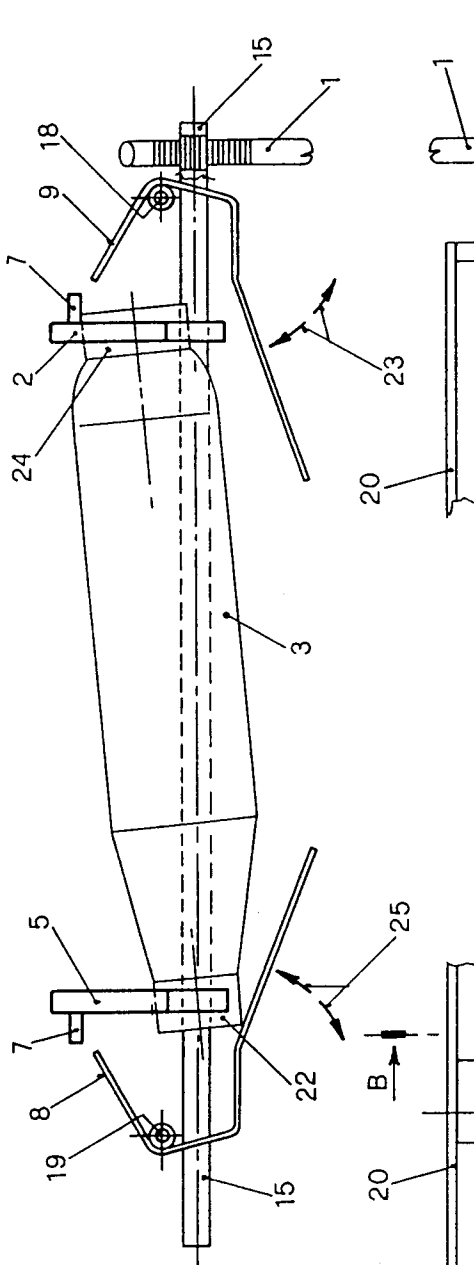


Fig.1

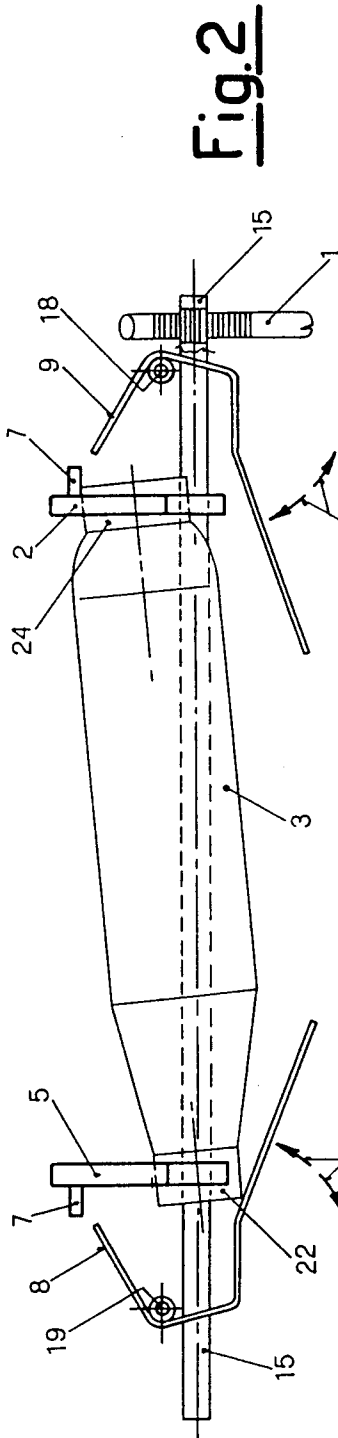


Fig.2

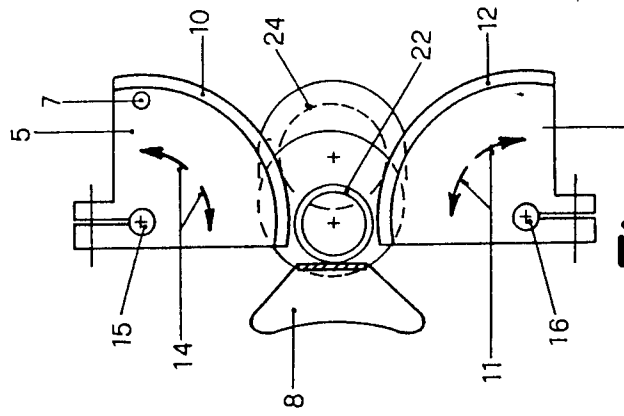
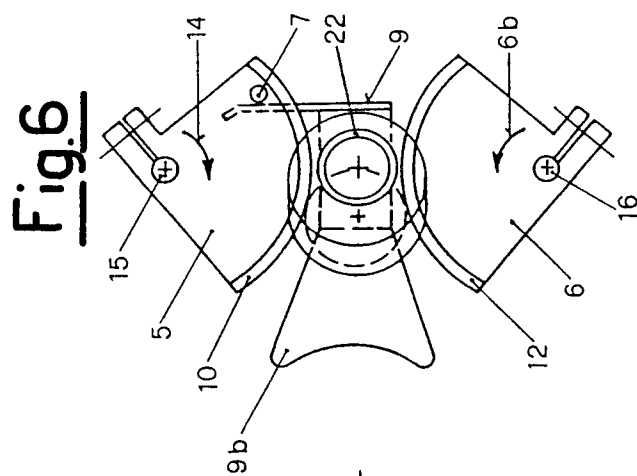
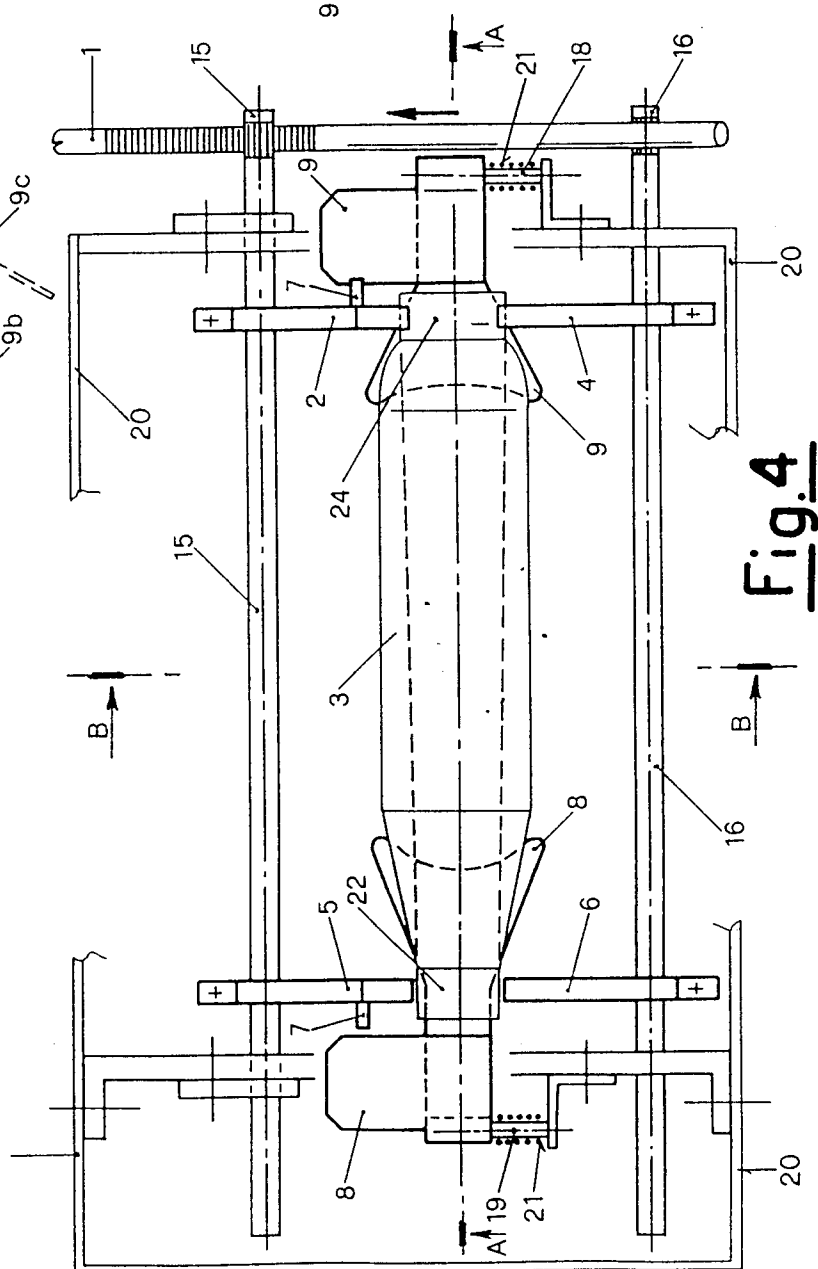
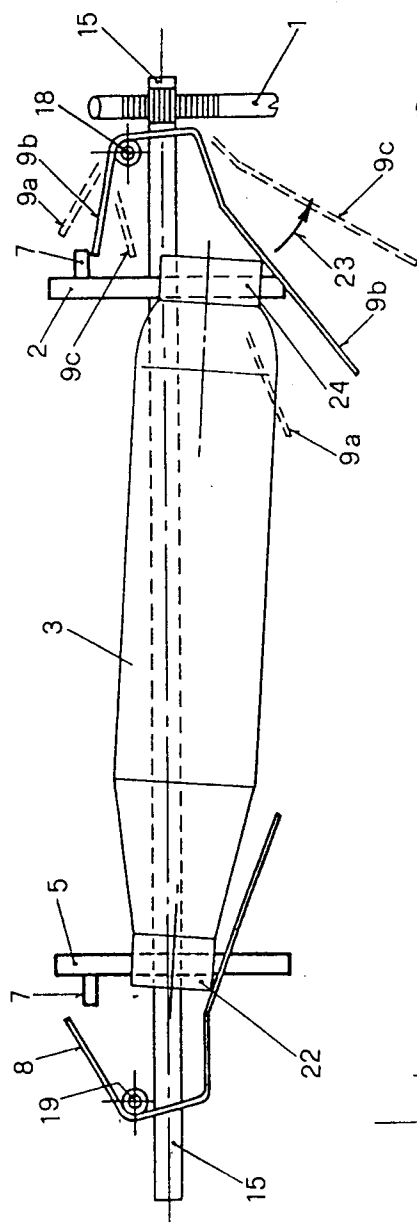
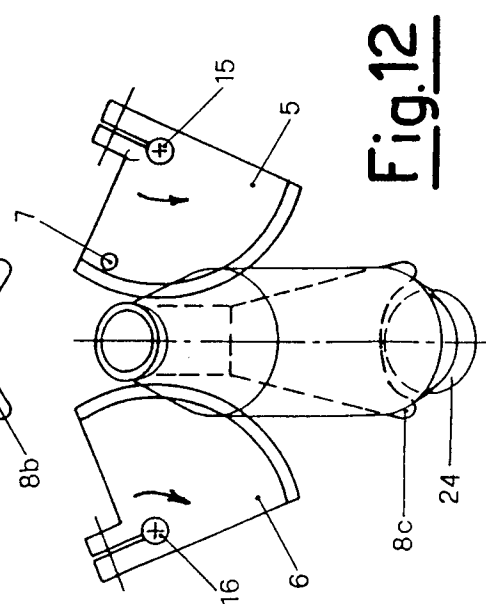
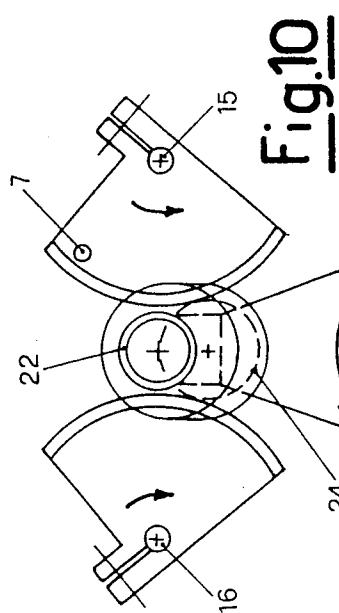
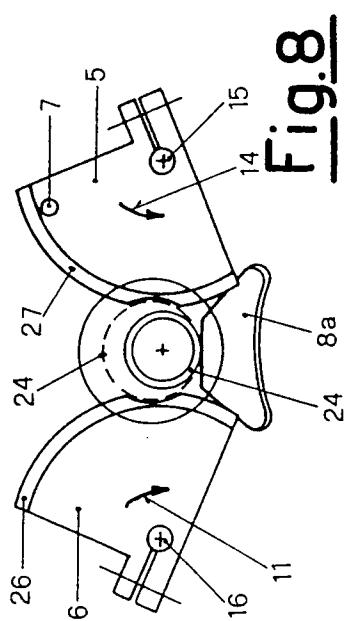
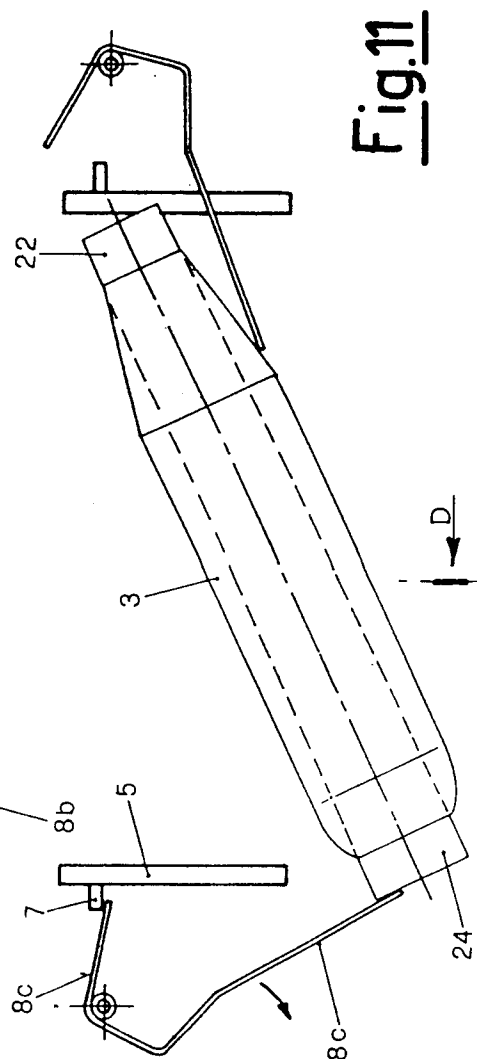
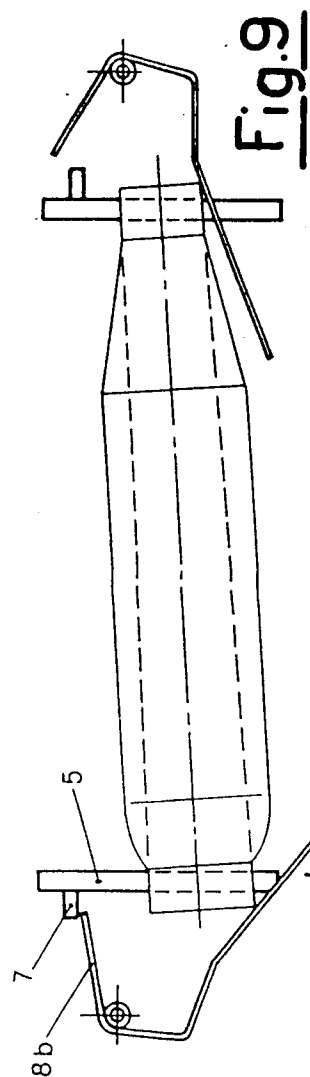
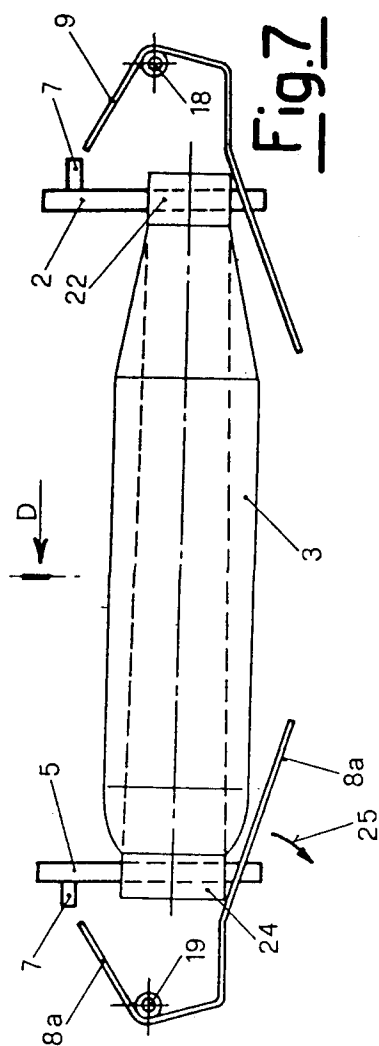
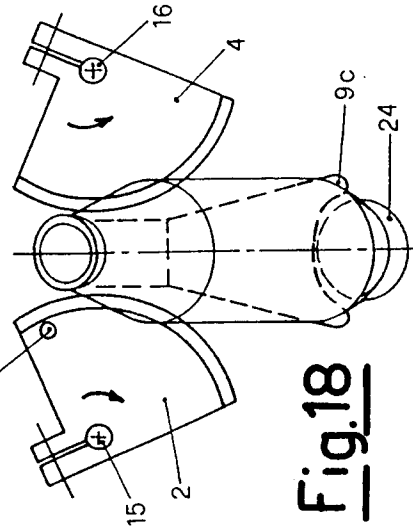
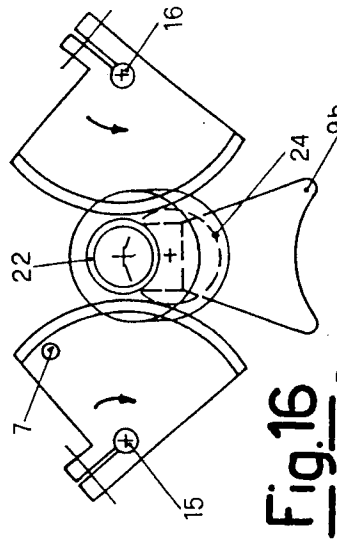
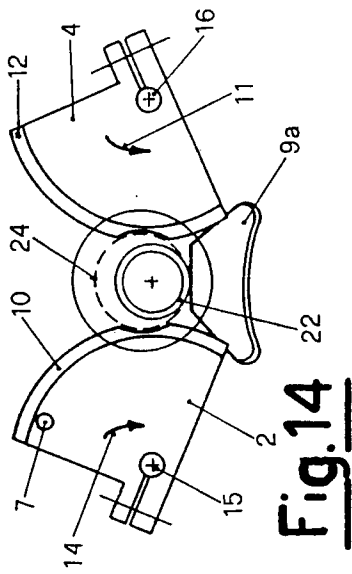
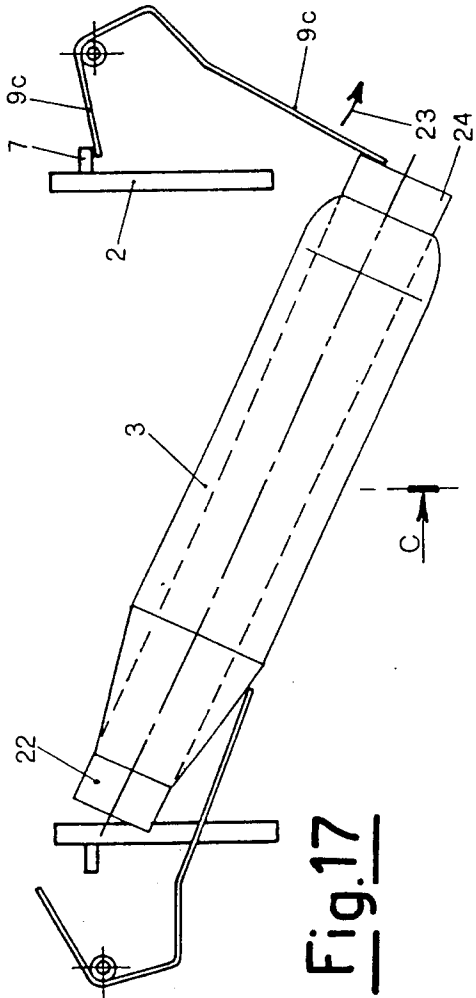
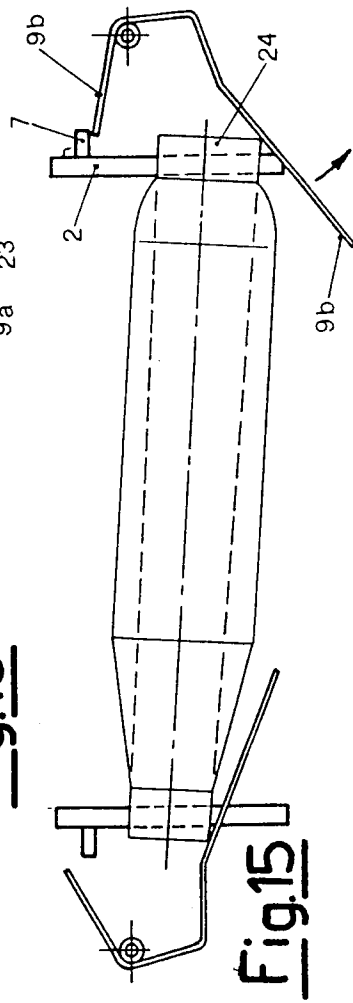
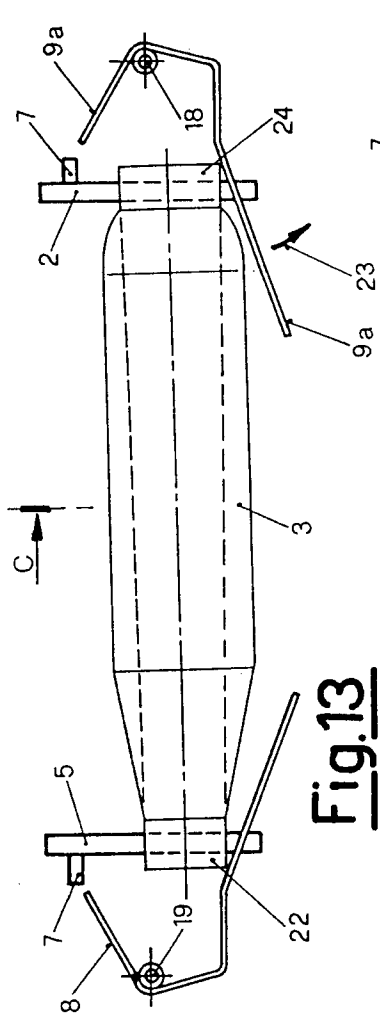


Fig.3









European
Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 20 2090

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	FR-A-2 367 007 (C. EUGEN MAIER METALLVERARBEITUNG GMBH) * page 12, line 22 - line 35; claims 1-3,9,11-13 **** page 16, line 36 - line 39; figures 1-6 ** - - -	1,2,3,6	B 65 H 67/06
A	EP-A-0 276 880 (SAVIO SPA) * abstract; claims 1-5; figures 1-4 ** - - -	1	
A	EP-A-0 054 775 (MASCHINENFABRIK RIETER AG) * abstract; figures 1-3 *** page 10, line 9 - column 32 ** - - -	2	
A	EP-A-0 330 245 (MASCHINENFABRIK RIETER AG) - - -		
A	GB-A-1 262 015 (NUOVA SAN GIORGIO SPA) - - - - -		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 H D 01 H
Place of search		Date of completion of search	Examiner
The Hague		17 December 91	TAMME H.-M.N.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone		E : earlier patent document, but published on, or after the filing date	
Y : particularly relevant if combined with another document of the same category		D : document cited in the application	
A : technological background		L : document cited for other reasons	
O : non-written disclosure			
P : intermediate document		& : member of the same patent family, corresponding document	
T : theory or principle underlying the invention			