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(54) **Alignment and drawing unit downstream of a reel.**

(57) Alignment and drawing unit located downstream of a reel to hold round wire rods or sections for reinforcement of concrete for building work and positioned between the reel and a processing machine, such as a straightening machine, straightening and shaping machine or shaping or forming machine to produce shaped reinforcement stirrups, the reel containing at least two rolls of wound round rods or shaped sections (20), each ready roll having a pre-straightened protruding segment pre-positioned on the reel, the unit comprising at least two mating rollers (11-12) which have an inactive position (18) and a drawing position (19), in which drawing position (19) the rollers (11-12) are resiliently thrust against the reinforcement section (20), in which unit at least one of the rollers (11-12) is powered (14) and each roller (11-12) includes arms (13) diverging at the front of the respective roller (11-12) and cooperating in an engagement and guiding action.

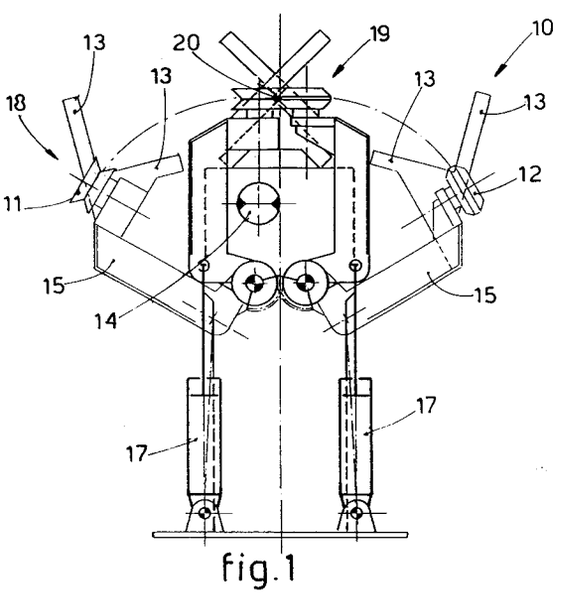

fig.1

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This invention concerns an alignment and drawing unit located downstream of a reel that feeds straightening and/or shaping and/or forming machines as set forth in the main claim.

The invention is placed downstream of a reel holding two or more rolls of wire rod or shaped sections for the metallic reinforcement of concrete for building work.

These rolls are suitable to feed a fast machine straightening and/or shaping and/or forming reinforcement stirrups for concrete for building work with its requirements of shaped reinforcements.

A reel is positioned upstream of a fast straightening and shaping machine suitable to produce reinforcement stirrups for building work which have a closed or open form and various dimensions, the stirrups being produced from reinforcement rods or sections of various cross sections. This reel holds two or more rolls of wire rods or sections having advantageously different cross sections.

The roll suited to the requirements of the shaped stirrups is selected; the end of the reinforcement wire rod or section is engaged and inserted into the straightening machine.

In relation to each roll, the end of the roll on the reel is already positioned with a straightened segment (usually straightened by hand) protruding from an unwinding station.

When it is necessary to replace the previous reinforcement wire rod or section, the previous section is used up or wound back on its own roll; the pre-straightened protruding segment of the new reinforcement section is engaged with a gripper or by hand and is inserted into the straightening machine.

All of the above is very easy and simple as long as reinforcement sections of a small cross section are being handled.

With modern reinforcing steels problems begin to arise with cross sections equivalent to a diameter of 12 millimetres, and these problems become substantial and require much time and a great expenditure of human energy when it is a question of processing sections with cross sections equivalent to diameters of sixteen millimetres or more.

It should be borne in mind that a shaped wire rod or section being unwound from a roll may become positioned in any direction in all three dimensions, and it is therefore necessary to engage that wire rod or section where it is positioned and also necessary to engage it while it normally possesses a movement due to the great ease of moving in three dimensions.

The present applicants have therefore examined the specific problems and also those linked to the various possible solutions and have studied, tested and embodied this invention.

The invention is set forth and characterized in the main claim, while the dependent claims describe variants of the idea of the embodiment.

According to the invention an alignment and drawing unit is positioned beween the reel and a processing machine and works on the axis of the normal path of the reinforcing wire rod or section.

The processing machine may be a straightening machine, a straightening and shaping machine or a shaping machine; these machines are especially intended to produce straight reinforcement elements or reinforcing stirrups for concrete for building work.

According to the invention the alignment and drawing unit has a drawing position and an inactive position. This unit comprises appropriate arms, which during the movement from the inactive position to the drawing position engage the end of the wire rod or section protruding from the reel and take it to the alignment and drawing position.

According to the invention at least two mating rollers are included of which at least one is powered. Each of these two rollers comprises two arms which extend respectively upwards and downwards at an angle to each other at the front of their respective rollers. The two arms of one roller are therefore approximately counterparts of the arms of the other roller.

These rollers can move reciprocally so as to take up a drawing position when they are cooperating with each other, and an inactive position when they are distanced from each other.

Their reciprocal displacement can be achieved with a straight movement or a curved movement, which is advantageously substantially circular. This movement can be substantially horizontal, substantially vertical or a combination of the two.

With the help of the attached figures, which are given as a non-restrictive example, let us see two preferred embodiments with a substantially horizontal movement as follows:-

Fig.1 shows an alignment and drawing unit according to the invention, entailing a substantially circular movement;

Fig.2 shows an alignment and drawing unit according to the invention, entailing a substantially straight movement.

In the figures, an alignment and drawing unit 10 comprises two mating rollers 11 and 12; in this case one roller 11 includes a circumferential V-shaped groove, while the other roller 12 is shaped so that it mates with that circumferential V-shaped groove.

Each roller 11-12 comprises engagement arms 13 arranged at an angle to each other and protruding from their specific roller 11-12. One of these rollers, the roller 11 in this case, is driven by a motor 14.

The rollers 11-12 are supported and positioned

on supporting arms 15 or on trolleys 16.

One or more actuators 17 are included to move the rollers 11-12 and to take them from an inactive position 18 to a drawing position 19. During this movement the engagement arms 13 engage a section 20 and convey it to a position of cooperation between the rollers 11-12.

In their drawing position 19 the rollers 11-12 are reciprocally thrust resiliently against the section 20.

A series of rollers 11-12 may be included instead of the two rollers 11-12.

Fig.2 shows that the embodiment can also be rotated by 90°, or else the trolleys 16 of Fig.2 can run on guides positioned at an angle to each other, for instance with their vertex upwards (not shown here) so as to reduce the overall lateral bulk.

Claims

1. Alignment and drawing unit located downstream of a reel to hold round wire rods or sections for reinforcement of concrete for building work and positioned between the reel and a processing machine, such as a straightening machine, straightening and shaping machine or shaping or forming machine to produce shaped reinforcement stirrups, the reel containing at least two rolls of wound round rods or shaped sections (20), each ready roll having a pre-straightened protruding segment pre-positioned on the reel, the unit comprising at least two mating rollers (11-12) which have an inactive position (18) and a drawing position (19), in which drawing position (19) the rollers (11-12) are resiliently thrust against the reinforcement section (20), the unit being characterized in that at least one of the rollers (11-12) is powered (14) and each roller (11-12) includes arms (13) diverging at the front of the respective roller (11-12) and cooperating in an engagement and guiding action.

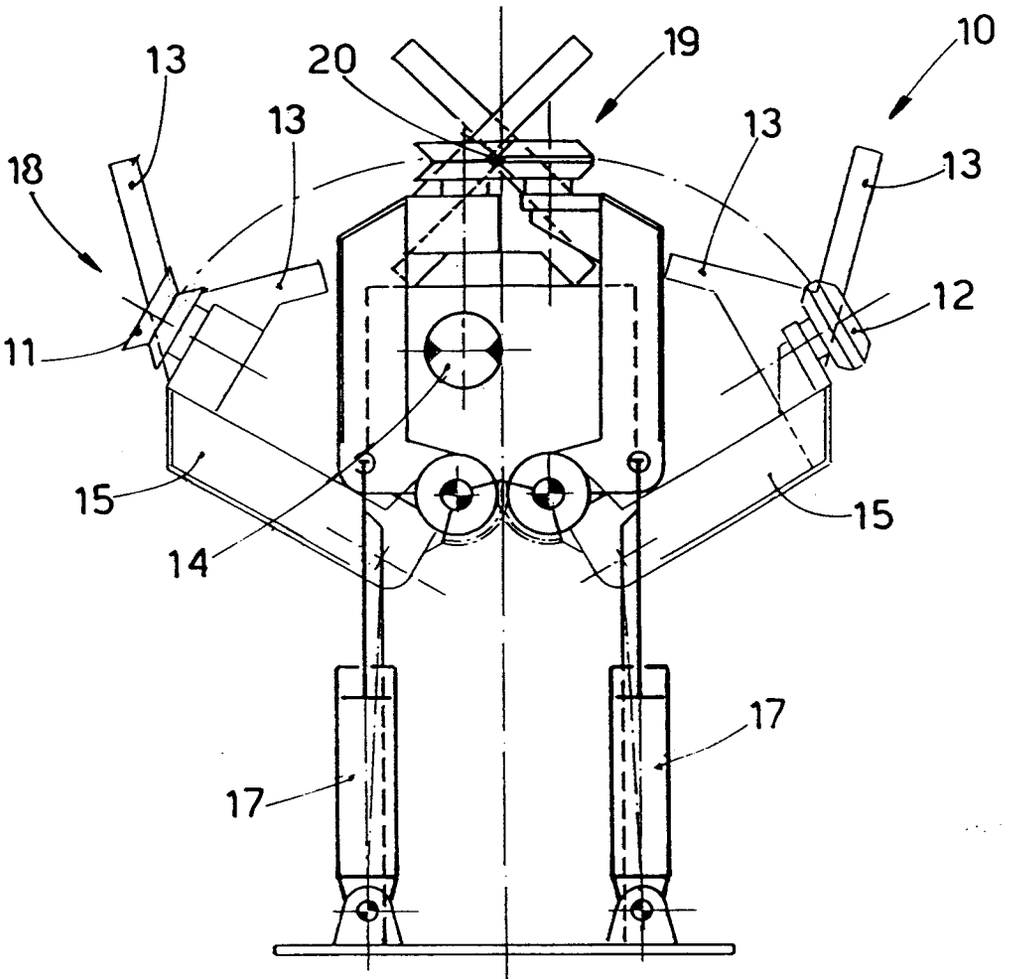
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fig.1

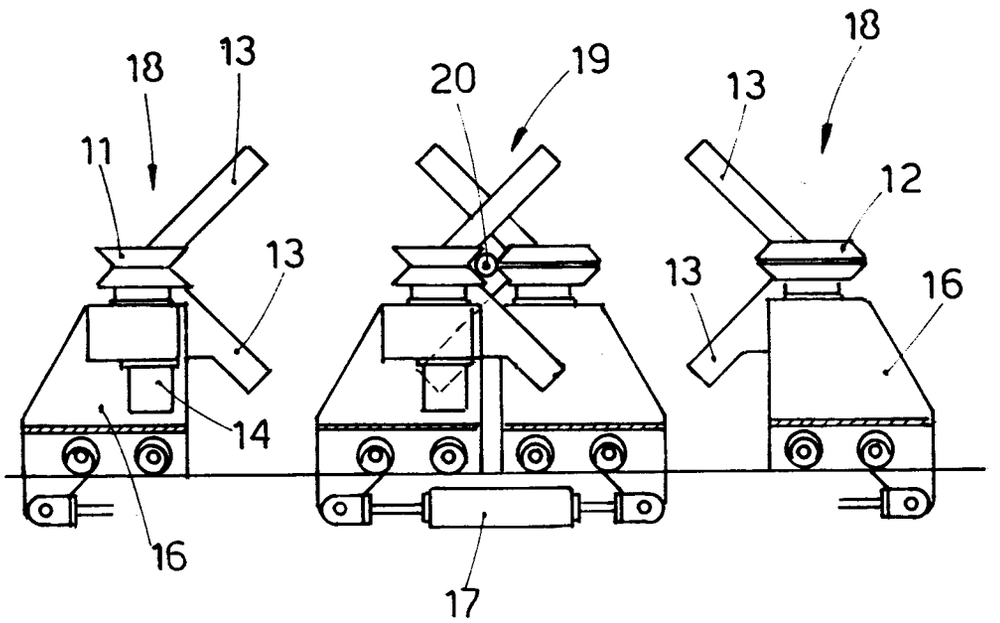
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fig.2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 10 4141

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-B-1 231 995 (IRMA UNGERER) * the whole document *	1	B21C47/34
X	DE-B-1 020 595 (FRITZ UNGERER) * the whole document *	1	
A	FR-A-2 178 232 (KABUSHIKI KAISHA SEIKOSHA) * page 3, last paragraph; figures 1,3 *	1	
A	US-A-3 054 575 (F. GERST) * the whole document *	1	
A	US-A-2 386 533 (C. LAKEWOOD)		
A	DE-A-3 402 568 (C. PEDDINGHAUS)		
A	US-A-2 070 444 (E. MIKAELSON)		
A	EP-A-0 267 357 (BRUDERER)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B21D
B21C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	12 AUGUST 1992	KORTH C-F.F.A.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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