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72 Inventor: Viscardi, Ettore  
Via Rossini 12  
I-24027 Nembro, Bergamo(IT)

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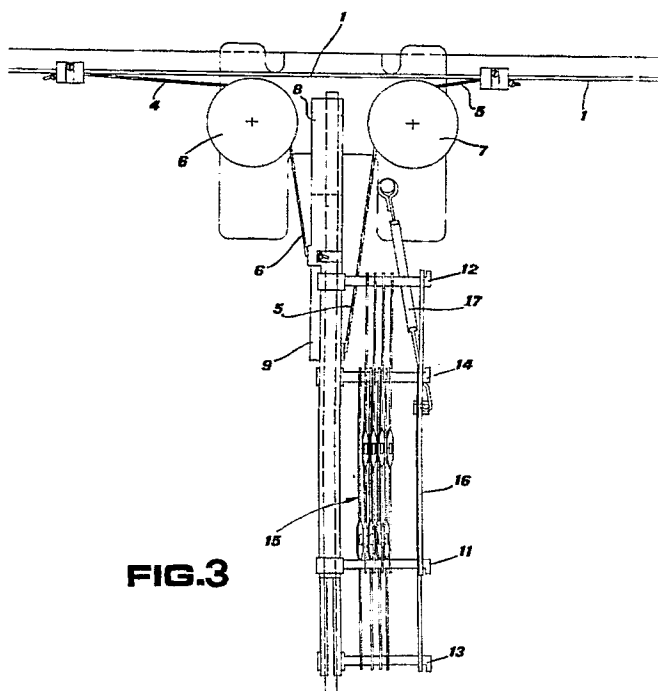
71 Applicant: SOMET SOCIETA' MECCANICA  
TESSILE S.p.A.  
Provinciale Valseriana Km. 23

74 Representative: Faggioni, Marco, Dr. Ing. et al  
FUMERO - Studio Consulenza Brevetti  
Widenmayerstrasse 4/I  
D-8000 München 22(DE)

54 Movable device to carry out the slotted leno heald weave on selvages of fabrics formed on shuttleless looms.

57 In a movable device to carry out the slotted leno heald weave on selvages of fabrics as they are formed on shuttleless looms - of the type independent from the heald frames, with a separate control therefrom which alternatively causes the lifting and lowering of selvedge shafts (11-14) -to said selvedge

shafts (11-14) there is associated at least one group of two links (15, 16) and a half-link of suitably reduced dimensions controlled by said selvedge shafts (11-14) to carry out the slotted leno heald weave.



**FIG.3**

# MOVABLE DEVICE TO CARRY OUT THE SLOTTED LENO HEALD WEAVE ON SELVEDGES OF FABRICS AS THEY ARE FORMED ON SHUTTLELESS LOOMS

The present invention concerns a device to carry out the slotted leno heald weave on selvedges of fabrics as they are formed on shuttleless looms.

As known, in weaving, the warp yarns positioned at the right and left ends of the fabric, besides moving up and down to form the fabric, also interlace horizontally, twisting around the weft to obtain a weave thereof. For this purpose, to carry out the so-called "slotted leno heald" weave, the half-link system - shown in fig. 1 of the accompanying drawings - is commonly used. With this system, two links A and B move in synchronism with the respective heald frames inside the lap. Between said links there is positioned a half-link C, connected to an elastic element - for the purpose of interlacing two yarns D and E - and pulled down alternatively by either one of the links A and B, starting from the overlapping position of said yarns D and E which have a common apex F. This system, which is extremely practical, allows to obtain a perfect weave, but it has the serious drawback of using up two heald frames to work in the lap, so that, if the loom works with other ground weaves, there are less heald frames available to work said ground weaves. Furthermore, since two heald frames - provided to merely carry out the slotted leno heald weave - are interposed between the ground frames and the reed, the distance between the utilizable frames and the area of weft insertion is disadvantageously increased, thereby facilitating the forming of flaws which can cause yarn breakages and faults in the fabric.

To prevent these drawbacks, various types of devices M have been realized - as shown in fig. 2 of the accompanying drawings - to work the slotted leno heald weave. Such devices are interposed - movable through the loom width - between the first heald frame and the reed, and they can for example be controlled by a cord system, the cord 1 being moved by a cam 2 in opposition to a return spring 3, or by an articulated leverage (not shown in the drawings).

The device according to the present invention now advantageously replaces said known devices M and adopts for the first time the half-link system, so far exclusively applied on heald frames, allowing to obtain all the known advantages typical of this system - i.e. simplicity, functionality, easy threading, and strong weaves with the use of only two threads (thereby creating no thickenings in the fabric) - without however suffering from its drawbacks when applied, as in conventional technique, to heald frames.

More precisely, the movable device according to the invention, apt to carry out the slotted leno heald weave on selvedges of fabrics as they are formed - of the type independent from the heald frames, with a separate control therefrom which alternatively causes the lifting and lowering of selvedge shafts - is characterized in that, at least one group of two links with a half-link of reduced dimensions is associated to said selvedge shafts, and in that, said selvedge shafts control said links and half-link to carry out the slotted leno heald weave.

The invention is now described in further detail, with reference to a preferred embodiment thereof, shown on the accompanying drawings, in which:

Figs. 1 and 2 show, respectively, the half-link system and the conventional M devices system to obtain the slotted leno heald weave according to known technique, as already seen above;

Fig. 3 is a front view of a device according to the present invention; and

Fig. 4 is a lateral view of the same device.

The device according to the invention (figs. 3 and 4) is applied similarly to the conventional devices M of fig. 2 (which refers to the weaving of a double roll of fabric with four selvedges) and is likewise controlled by a cord 1, the motion of which is caused by a cam 2 in opposition to a return spring 3 (fig. 2) positioned at opposite ends of the loom. Said cord 1 - by means of secondary cords 4 and 5 (fig. 3) connected thereto and rotating on pulleys 6 and 7 - pulls in alternatively opposite directions two racks 8 and 9 (fig. 4) cooperating by way of an interposed sprocket 10. According to the invention, on the racks 8 and 9 there are mounted small plates 11, 12, 13 and 14 - forming two pairs of selvedge shafts - which, following the movements of said racks, are alternatively lifted and lowered in accordance with the motion of the loom. Onto the selvedge shafts (or small plates) 11 to 14 there can be mounted links 15 for the weave - in a manner known per se - of the split selvedge and/or two links 16 combined in known manner (according to the diagram of fig. 1) with a half-link, to carry out a slotted leno heald weave. The links 15 are provided merely in the external devices M of fig. 2 (associated to the links 16) and are instead missing in the central device M (which thus only includes the links 16). The links 16, and the half-link associated thereto, are suitably of reduced size - as compared to the conventional links used in heald frames to carry out slotted leno heald weaves - so as to be fit for the device of the present invention. A spring 17 acts as return element for the half-link.

In use, the device according to the invention is controlled -like the devices M of fig. 2 - by the cord 1 which, moving horizontalwise alternatively in the two directions, according to the motion law of the loom, under the control of the cam 2 in opposition to the return spring 3, operates said devices M. In practice, the racks 8 and 9 of the device are alternatively moved up and down and cause the alternative lifting and lowering of the selvedge shafts 11 to 14 and, therewith, similar movements of the links 15 (where present), so as to form the split selvedge, and of the links 16, so as to carry out (in cooperation with the half-link associated thereto) the slotted leno heald weave.

Since the devices according to the invention can be interposed -and easily adjusted along the width of the loom - in the gap between the loom reed and the first heald frame - which is also the first utilizable frame for the ground weave of the fabric - the invention provides all the advantages of the half-link system, without suffering from its main draw back of increasing the distance between the reed and the first utilizable frame.

Suitable modifications can be introduced in the described and illustrated device, without thereby departing from the scope of the present invention; in particular, the links 15 to form the split selvedge can be replaced by links 16 for the slotted leno heald weave, so as to carry out the slotted leno heald weave on the split selvedge. This allows to use less arp yarns in the split selvedge and to reduce the length of the weft tails, allowing to save on split selvedge wastes.

It should be noted, furthermore, that this last configuration of the fabric can advantageously be obtained in that the device allows to have an out-of-phase advance or delay motion in respect of the motion of the ground frames. This phase difference is normally carried out in the movement of the split selvedge, which has to retain the weft released by the drawing gripper independently from the closing of the shed. Said function would not be obtainable with a slotted leno heald weave device mounted on the heald frames, since these move exclusively in synchronism with the ground weave. Thus, the device of the present invention will allow to carry out, far more than in the past, the slotted leno heald weave on split selvages, often given up now-a-days for the remarkable complications (especially for what concerns adjusting the width of the fabric being formed) created by the conventional devices adopted for this purpose.

formed on shuttleless looms - of the type independent from the heald frames, with a separate control therefrom which alternatively causes the lifting and lowering of selvedge shafts -characterized in that, at least one group of two links with a half-link of reduced dimensions is associated to said selvedge shafts, and in that, said selvedge shafts control said links and half-link to carry out the slotted leno heald weave.

## Claims

Movable device to carry out the slotted leno heald weave on selvages of fabrics as they are

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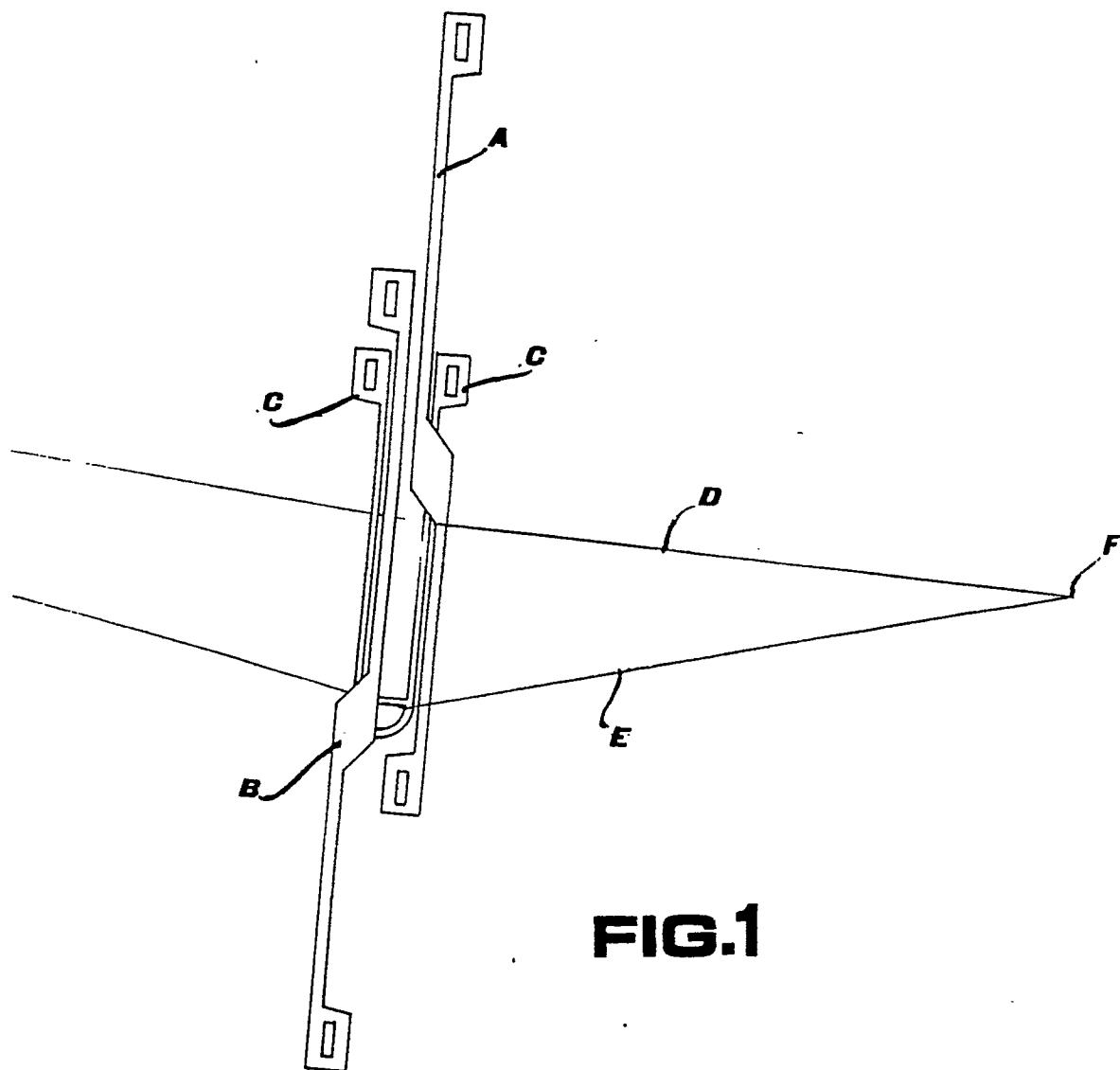
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**FIG.1**

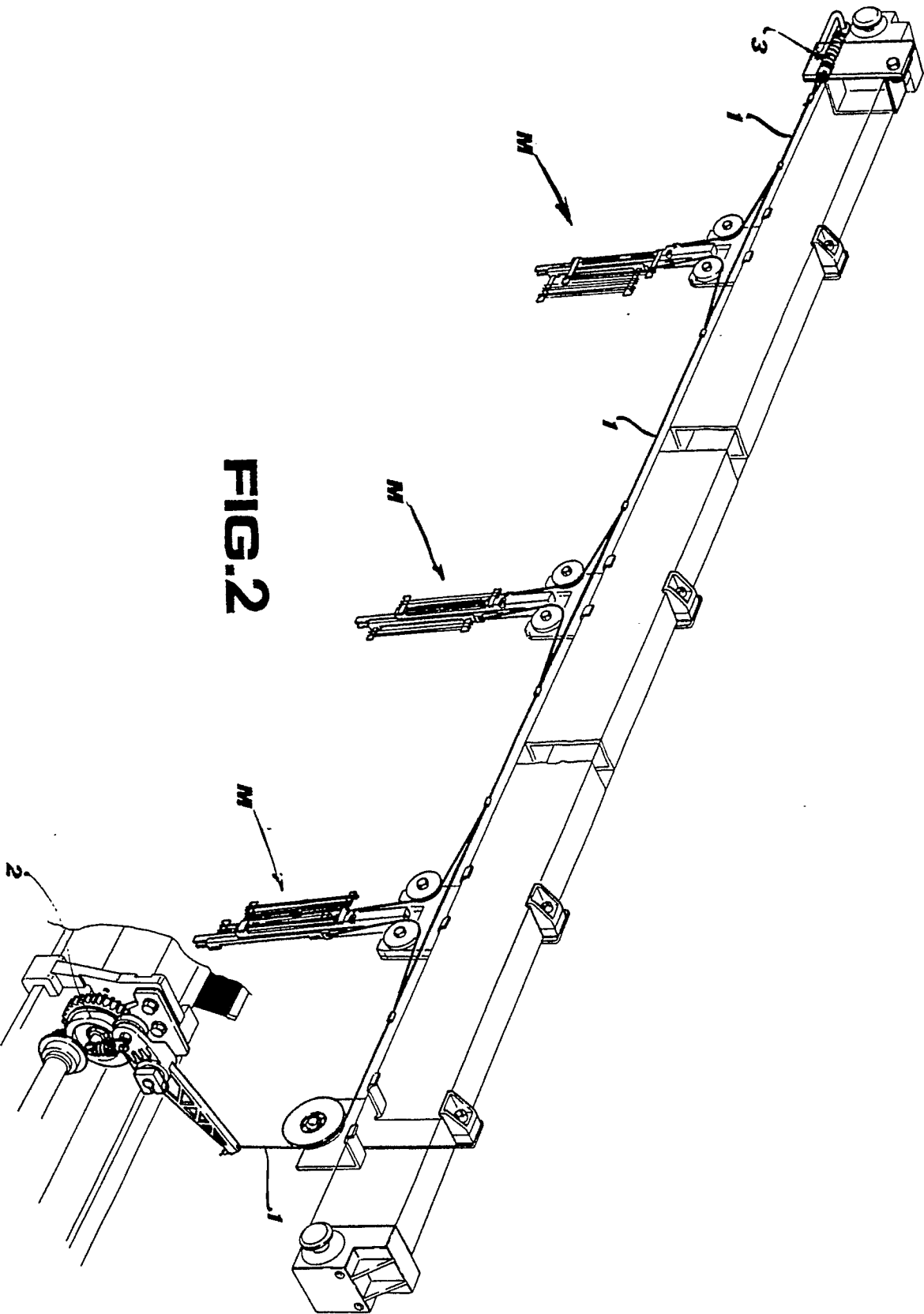
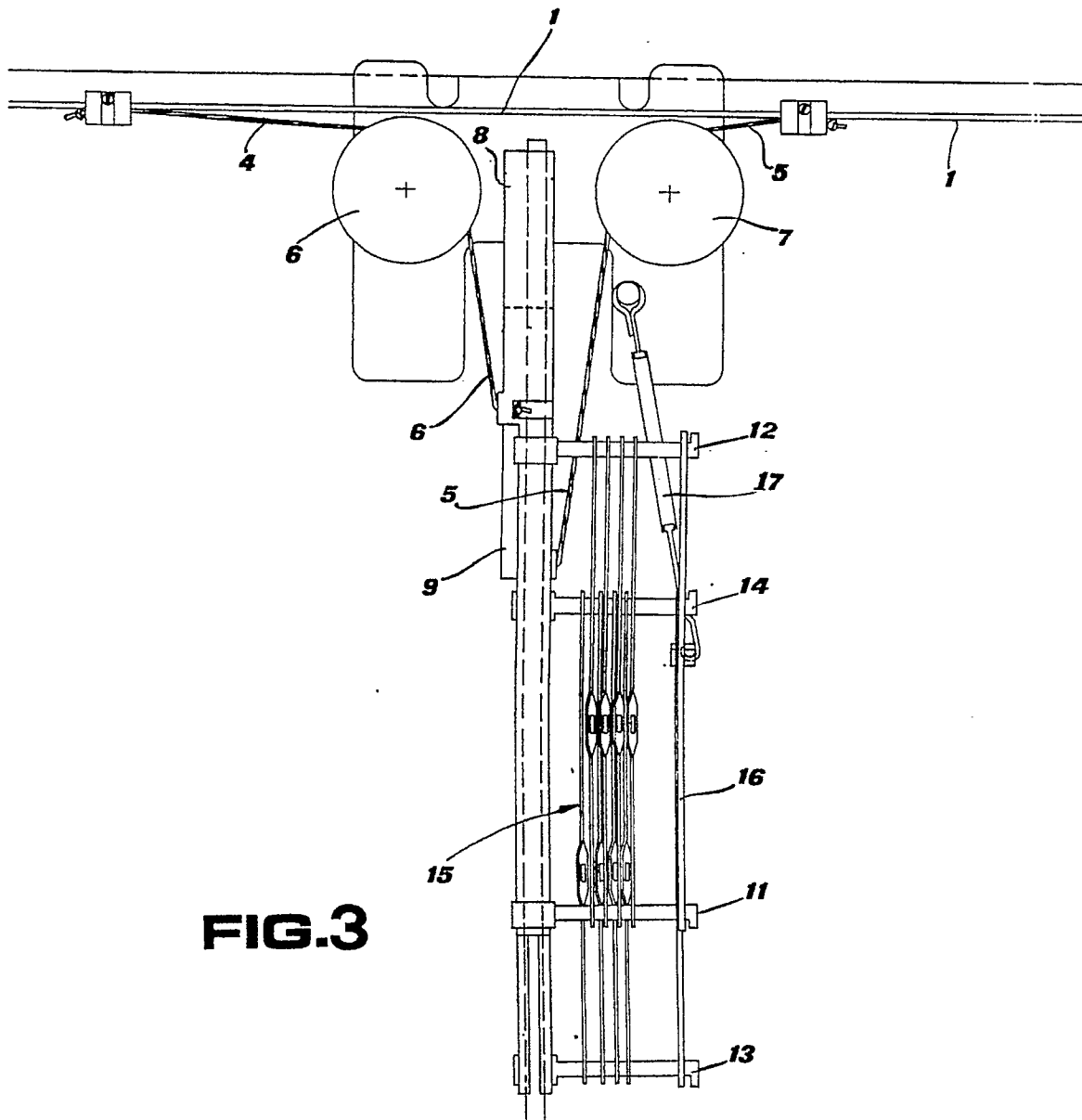
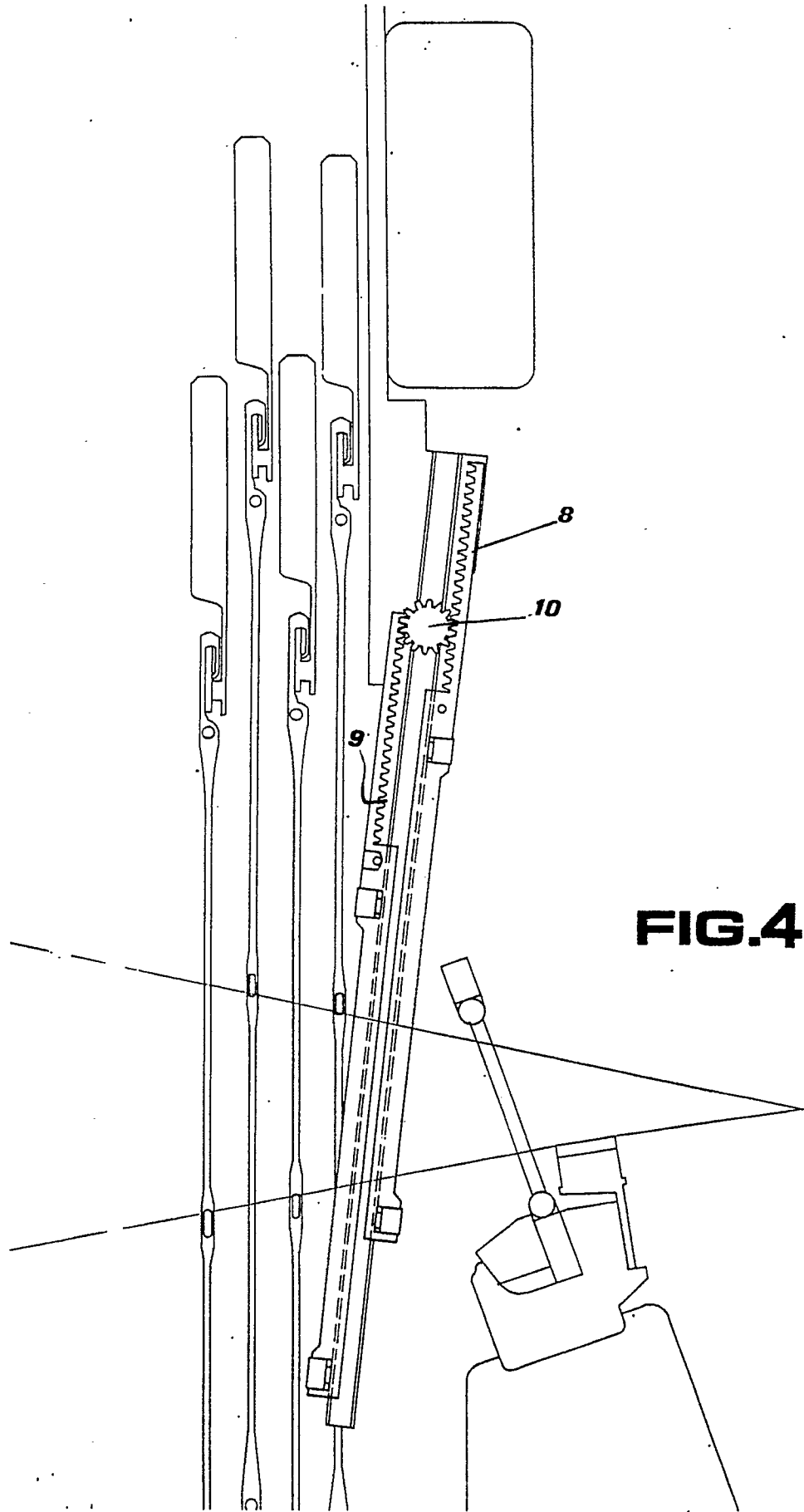


FIG.2



**FIG.3**



**FIG.4**



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number

EP 90 10 6796

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	US-A-3255783 (WALL) * the whole document *	1	D03C7/00 D03C11/00
A	FR-A-2141601 (LEBOCEY) * the whole document *	1	
A	DE-B-2615989 (RUTI)		
A	FR-A-2315556 (EELHARF)		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			D03C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26 JULY 1990	Examiner BOULEGIER C.H.H.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document I : theory or principle underlying the invention F : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			