(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 170 918**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **85108544.9**

(22) Date of filing: **09.07.85**

(51) Int. Cl.⁴: **A 63 B 69/18**, A 63 B 23/04

(30) Priority: **18.07.84 IT 8561284**

(43) Date of publication of application: **12.02.86**
Bulletin 86/7

(84) Designated Contracting States: **AT BE CH DE FR GB LI LU NL SE**

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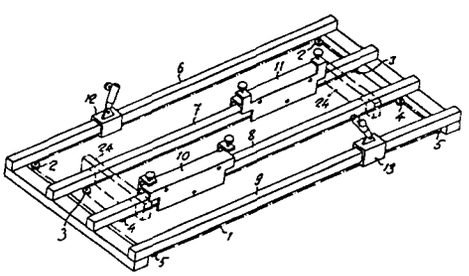
(54) Pre-skiing exercise implement.

(57) The invention provides a pre-skiing exercise implement which is adapted for a cross-country running ski training. The implement consists of a frame carrying four parallel tubular members (6, 7, 8, 9), of which the intermediate tubular members (7, 8) support two saddles (10, 11) which in turn have a pair of ski firmly fastened thereto; the lateral tubular members (6, 9) support two slides (12, 13) on which the tubular supports (30) for the ski poles are lodged. The ski-carrying saddles and the ski poles-carrying slides are all connected with only one flexible driving menas (1) which may be a rope, a chain or a belt sliding under the frame on suitable guides. Thanks to such a type of connection, to a forward movement in one direction of one of the ski-carrying saddles there corresponds an equal movement of the other saddle in the opposite direction; a simultaneous, equal and discordant movement of the slides which carry the ski poles is obtained.

Thus, a coordinate leg and arm movement typical of the alternating step in cross-country racing ski is obtained.



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"Pre-skiing exercise implement"

The invention provides a mechanical implement which is adapted for doing, with a pair of ski and suitable shoes, a pre-skiing exercise particularly suitable for a cross country running ski (langlauf) training. To be efficiently done, cross-country running ski, like any other sport, needs suitable physical training. In fact, this sport requires first of all a good physical strength and a good training of the leg and arm muscles, especially when an athlete desires to cover a long way of a combined type, comprising flat stretches and uphill and and downhill stretches.

Presently, the athletic preparation for this sport is mostly made in a gymnasium by doing special free-standing exercises for strenghthening the legs and arm

muscles and for causing certain particular muscles to work in conditions being quite similar to the real conditions.

Specific implements adapted for a cross-country racing ski training are not known to the applicant, and neither appear to be on the market, so that anybody desiring to have recourse to the aid of mechanical implements, is compelled to use a bicycle attached to the ground, a rowing-machine, or the like, but all these implements although athletically preparing certain muscles, undoubtedly do not give rise to the actual conditions that are produced when engaging in cross-country racing ski.

A matter of particular importance is the coordination of the arm and leg movements, which in cross-country racing ski is carried out in a quite particular manner, and certainly is, for example, different from the coordinate movements which are obtained with a rowing machine.

By the present invention a mechanical implement is provided, the object of which is of obtaining with the utmost repetion accuracy, coordinate leg and arm movements typical of cross-country running ski; more particularly, with the said implement it is put into effect the alternating step which is the typical movement performed on a flat or slightly sloping ground by a person doing the said sport.

A further object of the invention is that the gymnastic leg and arm movement is to be performed while wearing a pair of ski and shoes, and while gripping the ski poles, this in order to create with the utmost possible accuracy the effective operating conditions.

These objects are attained by a manually moved implement comprising a frame which is formed by four longitudinal tubular members being preferably square or rectangular in cross section, and by two connecting cross bars, and is characterized in that two saddles which are slidable on the intermediate tubular members, and support a pair of ski, perform alternately opposite forward and backward movements according to an adjustable excursion thereof, the said saddles being connected with only one flexible driving means sliding under the frame on suitable guides, so that to a forward movement in one direction of one of the ski there corresponds an equal backward movement in the opposite direction of the other ski.

According to the invention, the two outer tubular members of the implement, which are parallel to the intermediate tubular members, carry two slides which are slidable on the said tubular members.
Connected by means of a hinge to each one of the slides there is a small socket for receiving the point of a ski pole. Also the slides are fastened to the flexible means consisting of a chain, a rope, or a toothed belt, whereby they are imparted as well an alternate discordant

movement.

The movements of the ski fastened to the saddles and of the ski poles fixed to the slides, which are coordinated by the flexible means located under the frame, exactly reproduce the arm and leg movements that are typical of the alternating step in cross-country running ski.

Other features and advantages of the implement of the invention will become more clearly apparent in the specification of one preferred embodiment of the implement, made by way of a non-limiting example, and shown in the accompanying sheets of drawing, in which:

Figure 1 is a perspective view of the implement without the safety rail.

Figure 2 and Figure 3 show two different ways of attaching the limit stop members limiting the travel of the saddles.

Figure 4 is a perspective view showing one of the two ski-carrying saddles provided in the implement.

Figure 5 diagrammatically shows the path of the flexible means located under the frame, with which the slides and the saddles are connected.

Figure 6 is a sectional view showing one slide with the socket for receiving one ski pole.

Figure 7 is a further partial view of the implement, showing the safety rail of the implement.

Referring to Figure 5 and to Figure 1, the flexible means 1 which may be at will a wire rope or a synthetic fibre rope, a chain, or a belt with or without teeth, runs along a closed path and is supported by the pair of pulleys 2 secured to the ends of the tubular member 6, the pair of pulleys 3 secured to the ends of the tubular member 7, the pair of pulleys 4 secured to the ends of the tubular member 8, and the pair of pulleys 5 secured to the ends of the tubular member 9. The saddles 10 and 11 which are slidable on the tubular member 7 and 8, and the slides 12 and 13 which are slidable on the tubular members 6 and 9, are connected with the flexible means 1 through mechanical devices to be described later. Thus, to a forward movement in one direction of, for example, the saddle 10, there corresponds an equal forward movement of the slide 12, while a backward movement of the same length of the saddle 11 and the slide 13, is simultaneously occurring. Therefore, by fastening with suitable means the ski onto the saddles 10 and 11 and the ski poles onto the lateral slides, the alternating step typical of cross-country racing ski will be reproduced.

Actually, a person which mounts the implement and locks its shoes to the special ski fasteners attached to the saddles, and inserts the ski poles into the sockets carried by the lateral slides, once it has made only one forward or backward movement with one foot, is induced by the devices of the implement to move its legs and arms according to the alternating step.

Figure 4 shows the connection between one tubular member and one saddle, and between one saddle and the rope. More particularly, the saddle 11 which is shown in this Figure, is formed by a U-shaped plate which is slidable on the tubular member 7 having a rectangular cross-section, by the aid of a pair of rollers 14 and 15, provided with shoulders, and which are pivoted onto the saddle and roll on the upper surface of the tubular member 7.

Provided at the lower end of the plate is a further guide roller 16 also pivoted onto the saddle 11, which contributes in a determining manner to the straight sliding motion of the saddle. A flat plate 17 provided with threaded bores 18 in which the screws are received for clamping the platelet 19 against the rope 1, is located in correspondence of the bottom of the tubular member 7 and is welded to the saddle 11. Thus, the connection between the saddle 11 and the lower rope 1 is ensured.

At its top the saddle 11 has two angles 20 and 21

which are welded to this saddle and are provided with screws 22 and 23 for fastening the ski placed on the saddle. It is important that the saddles 10 and 11 be provided with limit stop members, whereby the pace of the person using the gymnastic implement will not exceed its physical possibilities. This is important particularly for children or generally for short-legged persons. Therefore, two limit stop members 24 are provided, which are placed at a same distance from the cross bars, and are arranged between the saddle-carrying tubular members so as to overlap same. For the operation of the thus conceived implement only one limit stop member would be required, since the two saddles 10 and 11 alternately abut against one limit stop 24.

The fact that instead of only one, two limit stop members are provided arises from the need of rendering the implement as safe as possible, and then free from any risks deriving, for example, from having been unsafely locked in position one limit stop.

In Figure 2 there is shown the limit stop member 24, which consists of a bar having two C-shaped recesses, such that the bar can be placed astraddle of the tubular members 7 and 8. In the case of Figure 2, the locking in position of the limit stop member 24 is effected through the pressure exerted by the tightened screws 25 and 26.

A variant shown in Figure 3 provides for the bar 24 to be blocked by means of screws which are received in matching bores 27 and 28 in the bar-supporting tubular members 7 and 8.

As above mentioned the slides 12 and 13 carry the sockets into which the ski poles are to be inserted. As particularly shown in Figure 6, the slide 12 which by means of a teflon bearing 36 is slidable on the tubular member 6, has an attachment member 29 to which a shaped socket 30 capable of receiving the point a ski pole 31, is hingedly connected at 35.
A screw 32 guarantees the fastening to the socket of the ski pole.

The driving of the slides is achieved by means of shaped platelets which clamp the underside of the rope 1, and which are secured with screws to each slide. In Figure 6, the slide 12 is made integral with the driving rope 1 by means of the shaped platelet 37 which sets the rope against the slide when the screws 38 and 39 are tightened.

By such a connection, the ski pole has only two degrees of freedom, which correspond to the reciprocating straight motion of the slide 12 and to the pivoting of the socket 30 about the hinge 35.

The gymnastic implement is provided with a further safety device consisting of an adjustable tubular rail

having its upper end approximately at the level of the waist of the person using the implement. This rail, which as a whole is designated by 40 in Figure 7, is formed by two tubular main supports 41 and 42 which are hingedly connected at 44 and 45, respectively, to the fore cross bar 43 of the implement, and by a C-shaped tubular bar 46 with the ends fitted into the tubular supports 41 and 42. The tubular bar 46 is adjustable in height by pulling up and fixing same by means of two lockable collars 47 and 48 with a known toggle device.

Moreover, the rail 40 is tiltable according to particular requirements and in relation to the user by unlocking the rings 49 and 50 which through a hinge are respectively connected to the rods 51 and 52, and are also provided with locking toggle means. Actually, also the rods 51 and 52 are in turn hingedly connected at 53 and 54, each to one bar 55, 56 welded to the cross bar 43. Thus, once the rings 49 and 50 have been unlocked, the rail 40 can be pivoted both forward and backward about the hinges 44 and 45, and once the preferred position has been set up, the re-locking of the rings 49 and 50 guarantees the stability of the selected position.

The necessity and the efficiency of the rail 40 resides in the fact that the person getting trained on the implement may happen to make some impetuous movements, with the result of throwing its body out of balance in the forward

direction, so that it is important that the tubular bar 46 of the rail performs in such an occurrence the function of additional support for the body.

Of course, numerous changes of constructional nature may be brought to the gymnastic implement of the invention: for example, the changes may relate to the mode of fastening the saddles and the slides to the flexible means which, as disclosed, may be a rope, a chain, or a belt with or without teeth, the number and the shape of the rollers for the saddles may be changed, and the rollers for the saddles may be as well replaced with equivalent mechanical means.

CLAIMS

1. An implement for doing pre-skiing exercise for cross-country running ski, comprising four parallel tubular members (6,7,8,9) preferably rectangular or square in cross section, which are rigidly mounted on two cross bars, characterized in that two saddles (10, 11) which are slidable on the intermediate tubular members (7,8) and carrying a pair of ski attachable onto the said saddles, perform movements of the same length but in opposite directions according to an adjustable maximum excursion, the said saddles being connected with only one flexible driving means (1) sliding under the frame on suitable guides, and further characterized in that two slides (12, 13) which are slidable on the lateral tubular members (6, 9) of the structure and which through hinges (35) are connected to the ski pole supports (30), perform discordant movements of the same length as the movements of the ski-carrying saddles, the said slides (12, 13) being also connected with the same flexible means for driving the ski-carrying saddles.

2. The implement according to Claim 1, characterized in that the coordinate movement of the ski-carrying saddles (10, 11) and of the ski poles-carrying slides (12, 13) gives origin to the movements of the legs and arms typical of the alternating step.

3. The implement according to Claim 1, characterized

in that the saddles (10, 11) are slidable on the tubular members (7, 8) by means of rollers (14, 15, 16) which are pivoted on the said saddles and are provided with guide shoulders, at least two (14, 15) of said rollers being into contact with the upper flat surface of the tubular member, and at least one (16) serving as guide member contacting the lower parallel surface of the tubular member.

4. The implement according to claim 1, characterized in that the slides (12, 13) which with the interposition of bearings (36) are slidable on the lateral tubular members (6, 9) have each an attachment member (29) to which a socket (30) receiving the point of a ski pole (31) is hingedly connected, the said ski pole-supporting socket being not only linearly movable in the direction of the slide-supporting tubular members (6, 9), but being also pivotable around the axis of the hinge (35).

5. The implement according to claim 1, characterized in that the travel of both saddles is limited by at least one limit stop member (24) consisting of a bar having two recesses of a shape mating with the shape of the saddle-supporting tubular members (7, 8), and which is fitted thereon transversely thereto, fastening means being provided for locking in the selected position the said bar on the saddle-supporting tubular members.

6. The implement according to claim 1, characterized in that a rail (40) having a protective function is

further provided, the said rail being formed by two main tubular supports (41,42) which are hingedly connected to the fore cross bar (43) of the implement, and have a C-shaped tubular bar (46) fitted into their feee ends, the said C-shaped tubular bar being upwardly pullable and being lockable in position by means of two collars (47, 48) provided at the free ends of the tubular supports (41, 42), the said main tubular supports (41, 42) being also tiltable through the unlocking and re-locking of two snap rings (49, 50) which by means of hinges are connected to rods (51, 52), which in turn are also connected by means of hinges to horizontal bars (55, 56) welded to the fore cross bar (43) of the implement.

7. The implement according to claim 1, characterized in that each ski-carrying saddle (10, 11) is connected with the flexible driving means (1) through the tightening of the screws that fasten a platelet (19) onto a horizontal flat plate (17) integral with the saddle, the flexible means (1) being interposed between the plate and the platelet.

8. The implement according to Claim 1, characterized in that each slide (12, 13) carrying a ski pole support (30), is connected with the flexible means (1) through a shaped platelet (37) facing the said flexible means, and which by the aid of screws (38, 39) is clamped against the slide.

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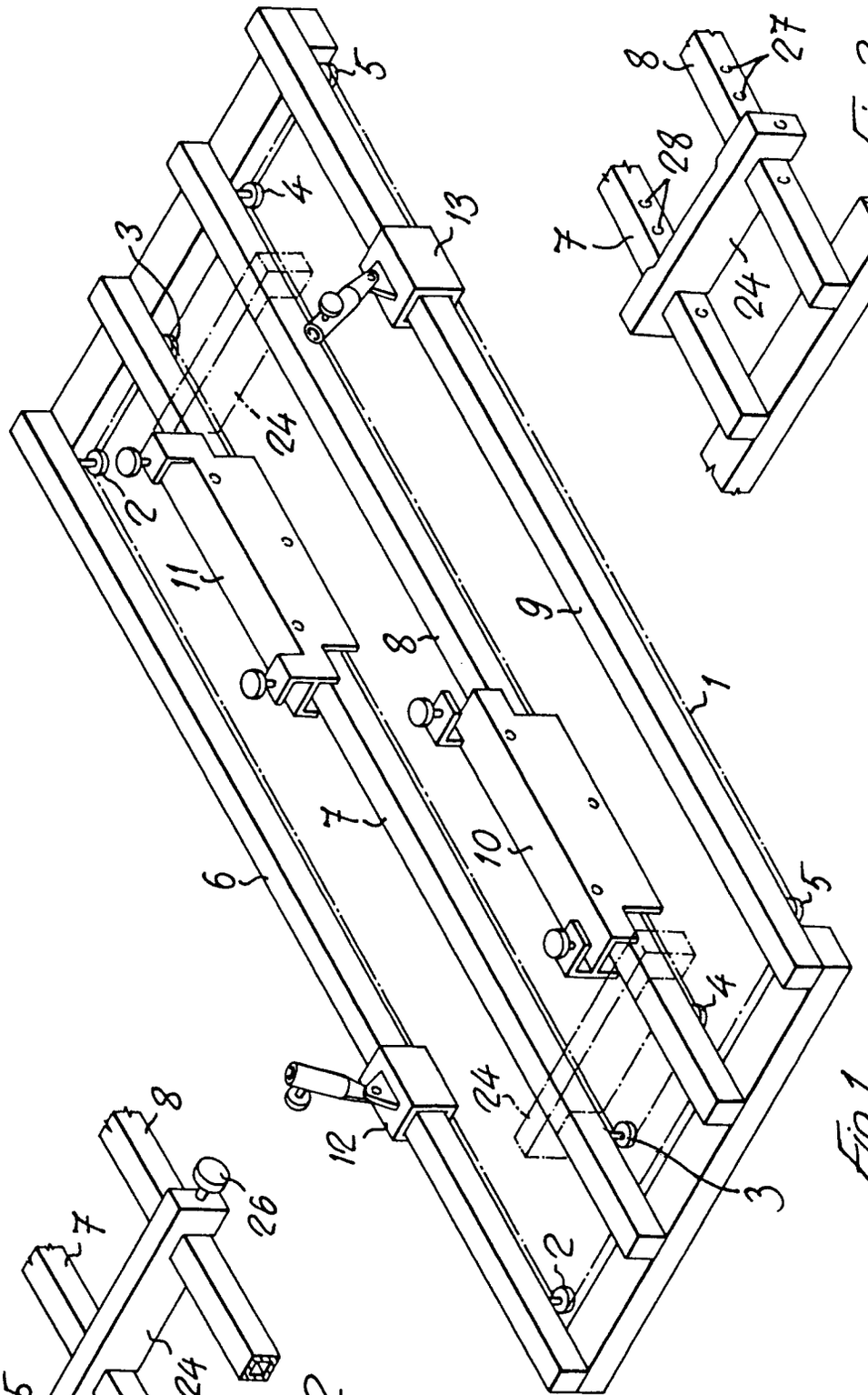

Fig. 1

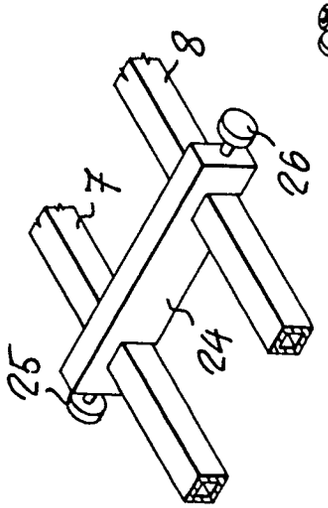

Fig. 2

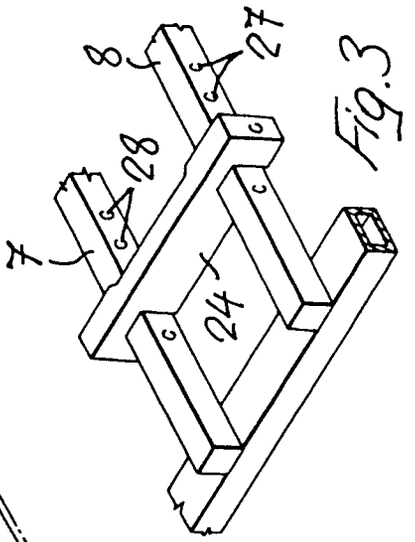

Fig. 3

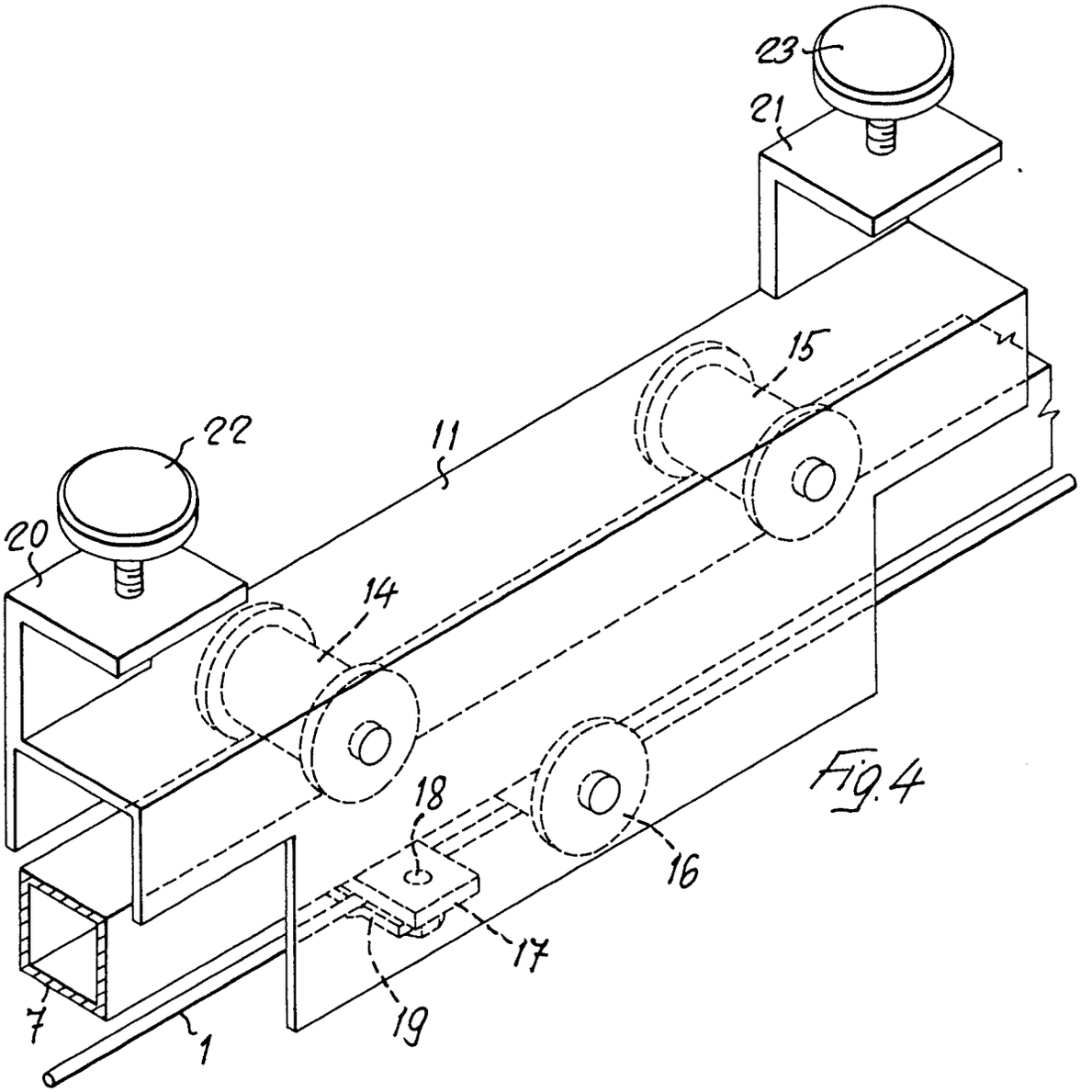

Fig. 4

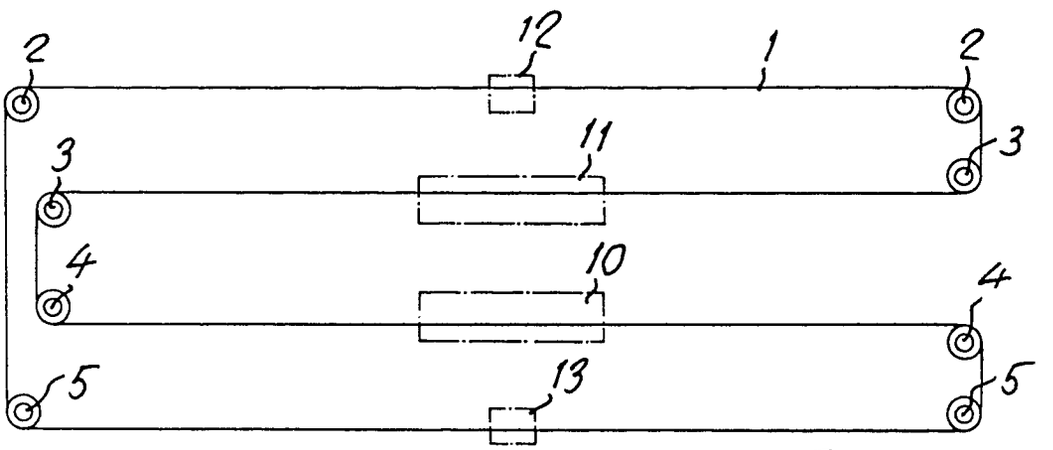

Fig. 5

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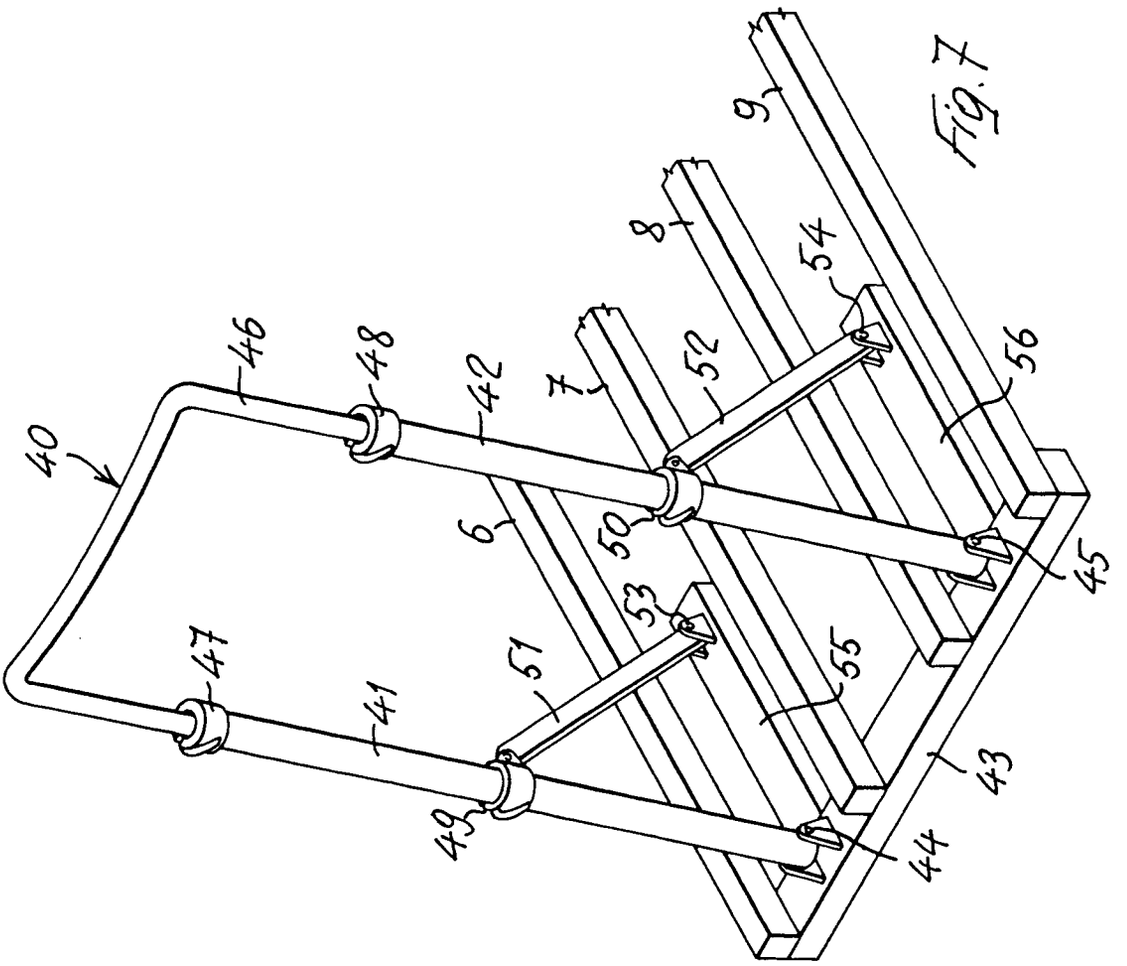

Fig.7

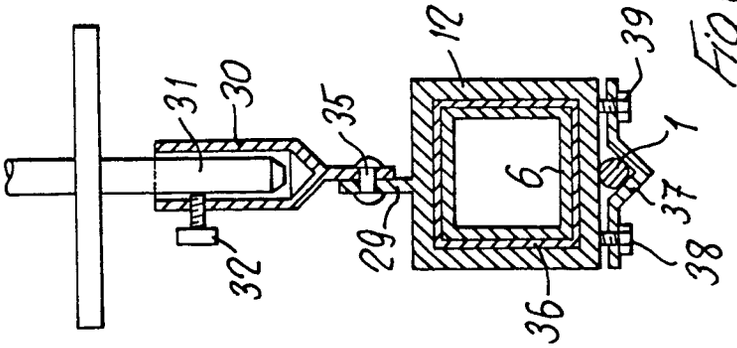

Fig.6

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EUROPEAN SEARCH REPORT

0170918
Application number

EP 85 10 8544

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.4)
X	CH-A- 207 538 (GRANDJEAN) * Claims; figures *	1,2	A 63 B 69/18 A 63 B 23/04
Y		3-5,7, 8	
Y	FR-A- 693 130 (SILVESTER) * Page 1, line 6 - page 3, line 65; figures *	3,5,7, 8	
Y	FR-A-2 292 494 (LECOMTE) * Figures 1-3 *	4	
A	US-A-4 229 001 (ROMAN) * Abstract; figures 1,6,7 *	3,5	TECHNICAL FIELDS SEARCHED (Int. Cl.4)
A	FR-A-2 374 055 (PATENTEC PAT. LTD.) * Figures *	6	A 63 B
A	US-A-4 408 759 (RENEAU) * Figures *	6	
A	DE-A-2 730 892 (HOLZAPFEL) * Figures *	6	
A	US-A-3 708 163 (HYNES)		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	31-10-1985	GERMANO A.G.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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