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(12) # EUROPEAN PATENT APPLICATION

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(54) **Roller or ice skate base plate and truck assembly.**

(57) This invention relates to roller or ice skate construction and includes a sole plate secured to or preferably embedded or encapsulated in the sole of a boot or shoe. A longitudinally extending channel or track extends below the plate (and below the under surface of the sole) and is formed integrally therewith, substantially along the center line of the sole plate. Skate trucks or sliders are provided with an attachment bolt assembly to secure the trucks or sliders at any desired location along the length of the track although the preferred embodiment includes stop means on the rear truck or slider to locate same at the rear end of the track and to maintain same in this position, as the location of the rear truck is generally static. A toe stopper assembly also slidably engages the track and is located at the front end thereof.

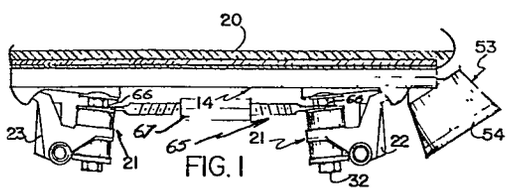

FIG. 1

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ROLLER OR ICE SKATE BASE PLATE AND TRUCK ASSEMBLY

BACKGROUND OF THE INVENTION

This invention relates to new and useful improvements in base plate and truck assemblies for roller or ice skates. The drawings and description refer primarily to the device when used for roller skates but it should be appreciated that it is easily adapted for use for the attachment of ice skate blades.

Conventionally, a sole plate is provided which is screwed to the underside of the sole of a boot or shoe and has a pair of fixed wheel-carrying trucks secured to the underside of the plate together with a toe stop device also secured to the plate.

Conventional constructions do not permit any longitudinal adjustment between the front and rear truck assemblies and many skaters require a slightly different longitudinal spacing so that a plurality of different sizes have to be manufactured and stocked for this purpose.

Furthermore, completely different sole plates are normally provided for ice skates so that two sets of boots and skates are usually required.

SUMMARY OF THE INVENTION

The present invention overcomes these disadvantages

and in accordance with the invention there is provided a sole plate assembly for use with a boot or shoe assembly which includes a sole member; said sole plate assembly comprising in combination a substantially planar plate having a heel portion, a sole portion and a shank portion therebetween, an elongated track extending substantially centrally along the under surface of said plate and being secured thereto and situated below the plane of the under surface of the plate, support surface engaging slider assemblies detachably secured in said track and means to detachably position and secure said slider assemblies at any desired location along the length of said track.

A toe stop assembly may be detachably secured to the front end of the track so that it can readily be replaced if necessary.

Another advantage of the present invention is the use of truck or slider assemblies which includes a mounting block for the truck or slider assembly thus giving the desired side to side flexibility for the roller skate wheels, said block being slidable within the track on the underside of the side plate and easily clamped in position where desired.

Another advantage of the present invention is

that the truck or slider assemblies are easily removed and replaced with somewhat similar assemblies which can carry an ice skate blade, if desired.

DESCRIPTION OF THE DRAWINGS

Figure 1 is a side elevation of the invention showing a sole molded integrally with the sole plate.

Figure 2 is a top plan view of Figure 1 with the sole removed and showing the top plan of the sole plate.

Figure 3 is a partially cross sectional view taken along the line 3-3 of Figure 1.

Figure 4 is a partially exploded side elevation of one of the truck or slider assemblies with the wheels removed for clarity.

Figure 5 is a fragmentary view of the upper nut of Figure 4, taken at right angles to Figure 4.

Figure 5A is an enlarged partially cross section-

ed view of the upper nut of Figure 4.

Figure 6 is a top plan view of the truck or slider assembly per se.

Figure 7 is a partially sectioned exploded view of the toe stop assembly per se.

Figure 8 is a front view of the sole plate per se with the toe stop mounting block in place.

Figure 9 is an isometric view of the toe stop mounting block per se.

Figure 10 is a view similar to Figure 4 but showing an alternative construction.

Figure 11 is a fragmentary side elevation of the preferred embodiment of the truck or blade holding bolt.

Figure 12 is an underside plan view of Figure 11.

In the drawings like characters of reference indicate corresponding parts in the different figures.

DETAILED DESCRIPTION

Proceeding therefore to describe the invention in detail, reference should be made to the drawings in which reference character 10 illustrates a sole plate preferably made of aluminum and having a heel portion 11, a shank portion 12 and a sole portion 13.

A track collectively designated 14 is formed integrally upon the underside of the sole plate and substan-

tially along the longitudinal axis thereof, said track defining a substantially T-shaped recess 15 when viewed in end elevation formed by a pair of spaced and parallel side members or walls 16, having inturned lower edges or flanges 17 terminating in spaced apart relationship to define an entry slot 18 therebetween.

In one embodiment, a plurality of drillings or apertures 19 are formed through the sole plate thus enabling same to be attached as by screws or the like, to the underside of the sole of a boot or shoe (not illustrated).

In another embodiment, this sole plate may be embedded or encapsulated within a poured plastic sole 20 between the upper and lower surface thereof, made of nylon or some similar or equivalent synthetic plastic upon which the shoe or boot top portion (not illustrated) may be secured in a conventional manner well known to those skilled in the art of boot and shoe manufacturing.

Truck or slider assemblies collectively designated 21 are provided, there being a front truck or slider assembly specifically designated 22 and a rear truck or slider assembly specifically designated 23. The truck assemblies are substantially identical in construction and differ only in the fact that they are reversed with reference to one another, when a pair of such truck assemblies is engaged

within the track 14 as will hereinafter be described. Also, in the preferred embodiment, the new truck assembly is provided with stop means as will hereinafter be described.

Wings 10A are preferably formed on the sides of the heel portion 11 extending upwardly and slightly outwardly to facilitate retention and anchoring of the sole plate within the plastic sole 20.

Details of the truck or slider assemblies are shown in the drawings and comprise a plastic or metal slider block collectively designated 23 comprising a main longitudinally extending body portion 24 having a pair of longitudinally extending open sided slots 25 formed one upon each side thereof thereby defining off standing wings 26 on the upper portion which slidably engage within the recess 15 from one end thereof and are retained in selective sliding relationship within the track 14, the inturned edges 17 of the track sides 16, slidably engaging the longitudinally extending grooves or recesses 25.

An enlarged portion 27 is formed at one end of the block 23 and a blind aperture 28 is formed in this enlarged portion situated at an angle with respect to the longitudinal axis of the block.

A further aperture 29 extends through the block

adjacent the opposite end 30 thereof and this aperture is large enough to receive shank portion 31 of a bolt 32 situated at an angle from the vertical axis of the block as clearly illustrated in Figure 4.

The head 33 of the bolt is at the lower side of the truck assembly 21 and a washer 34 is provided (and may be integrally formed) upon the inner side of the head and extends circumferencially around the bolt shank 31.

A resilient rubber bushing 35 slidably engages the shank followed by a truck component 36, a further resilient bushing 35A, a cup or similar washer 36 receiving the underside of the bushing and a jamb nut or lock nut 37 followed by a positioning washer 38 having lipped portions 39 upon opposite sides thereof which engage around the sides of the block 23.

The shank then passes through the aperture 29 in the block and the entire assembly is secured by means of a special nut collectively designated 40. This nut is provided with a sloping undersurface 41 and a shouldered portion 42 which slidably engages the opposite walls 43 of the space or opening 18 between the opposite inturned edges 17 of the walls 16 of the track.

In order to prevent any possibility of the assembly becoming detached due to loosening of the bolt relative

to the nut and the subsequent danger attendant therewith, means are provided to ensure that the nut cannot separate from the bolt once installed. This consists of an annular groove 44 formed around the distal end of the bolt shank 31 into which a snap ring 45 engages with the distal end and the snap ring situated within a recess 46 formed in the upper side of the nut as clearly shown in Figure 5A.

Support surface engaging means such as a truck 36, consists of a transversely extending axle support portion 46 through which an axle 47 is fixedly secured with conventional skate wheels 48 being journalled for rotation one upon each end of the axle 47. A bolt shank engaging portion 49 extends from one side of the portion 46 and is recessed on the upper and lower surfaces to receive in nesting relationship, the resilient blocks 35 and 35A.

A portion 50 extends upwardly and away from the portion 46 and terminates in a relatively short stub shaft portion 51 which, when the truck is assembled by tightening the bolt 32 relative to the nut 40, engages within the angulated drilling or recess 28 in the end of the block 23. This permits controlled sideways movement of the axle and wheels in the direction of the double headed arrows 52 shown in Figure 3 and is a desirable feature. By tightening the bolt 32 relative to the nut 40, the characteristics of this

resiliency may be controlled within limits.

In operation, the block 23 is slidably engaged within the track 14 with the bolt 32 slack relative to the nut 40.

When one of the truck or slider assemblies is positioned in the desired location relative to the track, the bolt 32 is tightened relative to the nut 40 which clamps the nut and truck assembly in the track, further tightening stiffening the resiliency of the transverse movement of the axle 47.

The other truck is then reversed with reference to the first truck assembly, inserted in the track, positioned as desired, and then tightened also.

If at any time it is desired to change the longitudinal relationship of the truck assemblies either relative to one another or relative to the sole plate, then the bolt 32 is merely loosened sufficiently to enable the truck assembly to be moved along the track whereupon the bolt is re-tightened.

A toe stopper assembly collectively designated 53 is provided and comprises a resilient block 54 having a recessed aperture 55 formed axially therein and a bolt aperture 56 extending from the center of the recessed aperture 55 all of which is clearly shown in Figure 7.

A bolt 57 having a socket-type bolt head 58 passes first through a washer 59 in the recess 55 and then through the bolt aperture 56.

A toe stopper block 60 is formed from metal or plastic with a track recess engaging upper plate 61 and a base portion 62 so that it slidably engages the track in a manner similar to block 23.

A screw threaded aperture or drilling 63 extends diagonally through the block and receives the bolt 57. The block is positioned in the front end of the sole plate track whereupon bolt 57 is tightened into the screw threaded aperture 63 thus extending clear through the drilling 63 until the distal end of the bolt 57 engages within an inclined aperture or drilling 64 (see Figure 2) formed adjacent the front end of the sole portion 13 of the sole plate 10. This effectively clamps the toe stopper in the desired position yet enables same to be removed readily and easily for replacement purposes, when desired.

If it is desired to use the sole plate assembly for ice skating, then modified truck assemblies may be secured within the track in a similar manner with a skate blade welded or otherwise secured between the truck assemblies and along the longitudinal axis of the sole plate.

Figures 1 to 9 show the holding bolt 32 with the

bolt head 33 at the lower end of the spirally shaped nut 40 at the upper end.

However, in the preferred embodiment, this bolt and nut may be reversed as shown in Figure 10.

In this embodiment the bolt head 33A is shaped in a manner similar to nut 40 with a sloping under surface 41A and a shouldered portion 42A which slidably engages the opposite walls 43 of the slot or opening 18 defined by the opposed inturned edges 17 of the walls 16 of the truck.

The nut 40A is preferably an elastic stop nut and is screw threadably secured to the lower end of the bolt as shown.

Reference should be made to Figure 1 which shows a turnbuckle assembly 65 extending between the bolts 31 adjacent the nuts 37. The eyes 66 on each end engage around the bolt 31 and the barrel 67 can be rotated to adjust the distance between the track assembly 21 and also act as a retainer to prevent inadvertent disengagement of the track assemblies from the track.

Figures 11 and 12 show the preferred embodiment of the bolt collectively designated 68 which is designed to be used in a manner similar to that illustrated in Figure 10 in which the bolt head assembly collectively de-

signated 69 engages the track 14.

The bolt includes the screw threaded stem 70 with the head assembly 69 on one end thereof, said head assembly including a cap portion 71 with a shouldered portion 72 formed intermediate the cap 71 and the upper end 73 of the stem 70. The under surface 74 of the cap extends outwardly upon each side of spaced and parallel sides 75 of the shouldered portion 72 and the under surfaces 74 of the extending portions of the cap 71 are serrated as illustrated by reference character 76. These extending sides or surfaces 76 engage upon the upper horizontal surfaces 77 (see Figure 3) of the inturned flanges 17 of the track and when clamped into position by the associated stop nut (not illustrated) assist in preventing untoward sliding movement from occurring between the truck or slider assembly and the track.

It will be noted that the underside of the cap portion 71, and the shouldered portion 72 are inclined relative to the longitudinal axis of the shank in a manner similar to that described for the bolt illustrated in Figure 10 thus providing the necessary angular relationship of the truck or slider assembly relative to the track.

In the appended claims, the truck assembly is referred to as a slider assembly regardless of whether wheels

or skate blades are mounted thereon, the term slider assembly referring to the adjustability of the assembly anywhere along the length of the track 14.

CLAIMS:

(1) A sole plate assembly for use with a boot or shoe assembly which includes a sole member; said sole plate assembly comprising in combination a substantially planar plate having a heel portion, a sole portion and a shank portion therebetween, an elongated track extending substantially centrally along the under surface of said plate and being secured thereto and situated below the plane of the under surface of the plate, support surface engaging slider assemblies detachably secured in said track and means to detachably position and secure said slider assemblies at any desired location along the length of said track.

(2) The invention according to Claim 1 in which said track is integrally formed with said plate and includes a pair of spaced and parallel walls extending from and perpendicular to the plane of the under surface of said plate and an inwardly extending flange formed on the lower sides of each of said walls, extending at right angles to said walls, the inner edges of said flanges being spaced apart and defining a longitudinally extending slot along the length of the sole plate and spaced below the plane of the under surface thereof.

(3) The invention according to Claims 1 or 2 in which each of said slider assemblies includes support

surface engaging means, a track engaging block slidably engaging said track for adjustable movement therealong and means securing said support surface engaging means to said block.

(4) The invention according to Claim 3 in which said means securing said support surface engaging means to said block comprises a bolt assembly extending through said support surface engaging means and said block and clamping one to the other.

(5) The invention according to Claim 3 in which said means detachably positioning and securing said slider assembly along the length of said track, comprises said bolt assembly, said bolt assembly extending into said track in detachable clamping relationship therewith.

(6) The invention according to Claim 5 in which said bolt assembly includes a screw threaded stem portion and a head formed on one end thereof, said head including a cap portion engaging over said inwardly extending flanges on the walls of said track and a narrower shoulder portion between the underside of said cap portion and said one end of said stem portion, having a pair of spaced and parallel sides slidably engaging between the inner edges of said flanges, said cap portion preventing downward displacement of said bolt assembly from said track, said shoulder por-

tions preventing axial rotation of said bolt assembly relative to said track.

(7) The invention according to any of the preceding claims which includes at least a front slider assembly and a rear slider assembly, said rear slider assembly including stop means formed thereon engageable with the rear ends of said track thereby preventing forward movement of said rear slider assembly along said track.

(8) The invention according to any of the preceding claims in which said substantially planar plate is detachably secured to the under surface of said sole.

(9) The invention according to any of the preceding claims in which said substantially planar plate is encapsulated within said substantially planar sole intermediate the upper surface and the under surface thereof, said track extending longitudinally along said sole and being situated spaced below the under surface thereof.

(10) A roller or ice skate base plate and truck assembly substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

(11) A sole plate assembly for use with a boot or shoe assembly which includes a sole member; said sole plate assembly comprising in combination a substantially planar plate, an elongated track extending along the under surface of said plate and being secured thereto and situated below the plane of the under surface of the plate, support surface engaging

slider assemblies detachably secured in said track and means to detachably position and secure said slider assemblies at any desired location along the length of said track.

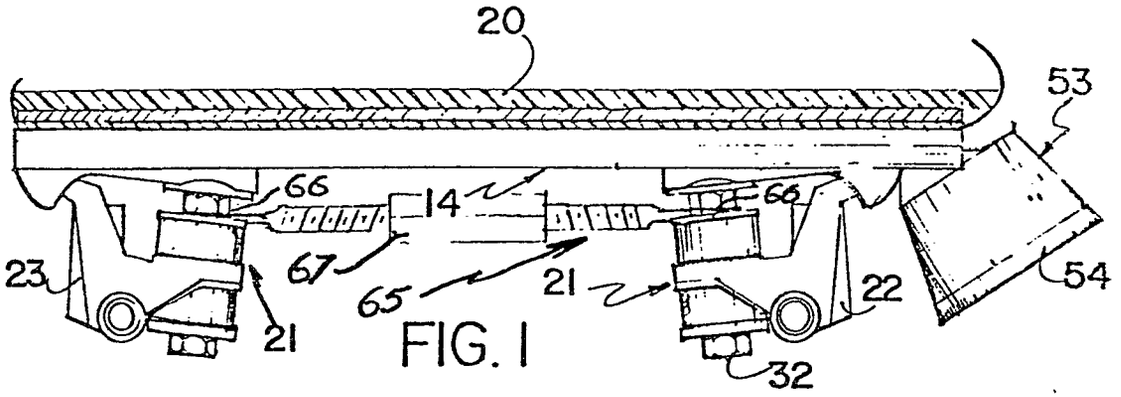


FIG. 1

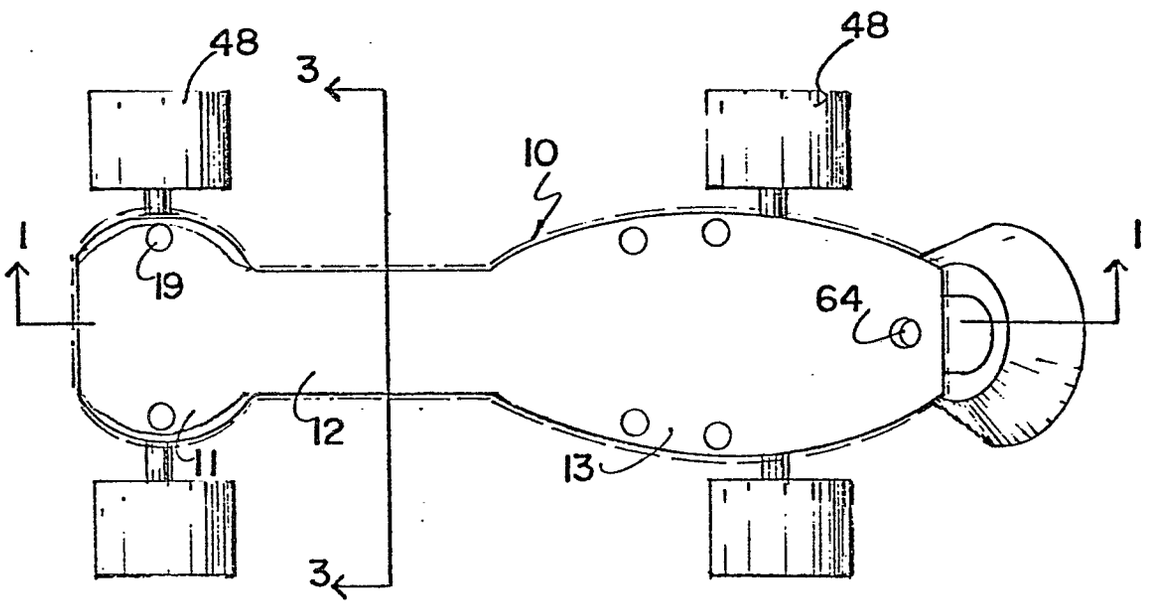


FIG. 2

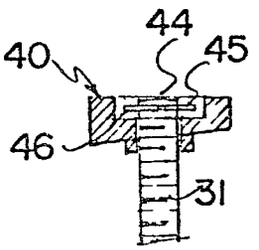


FIG. 5A

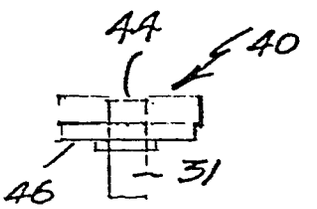


FIG. 5

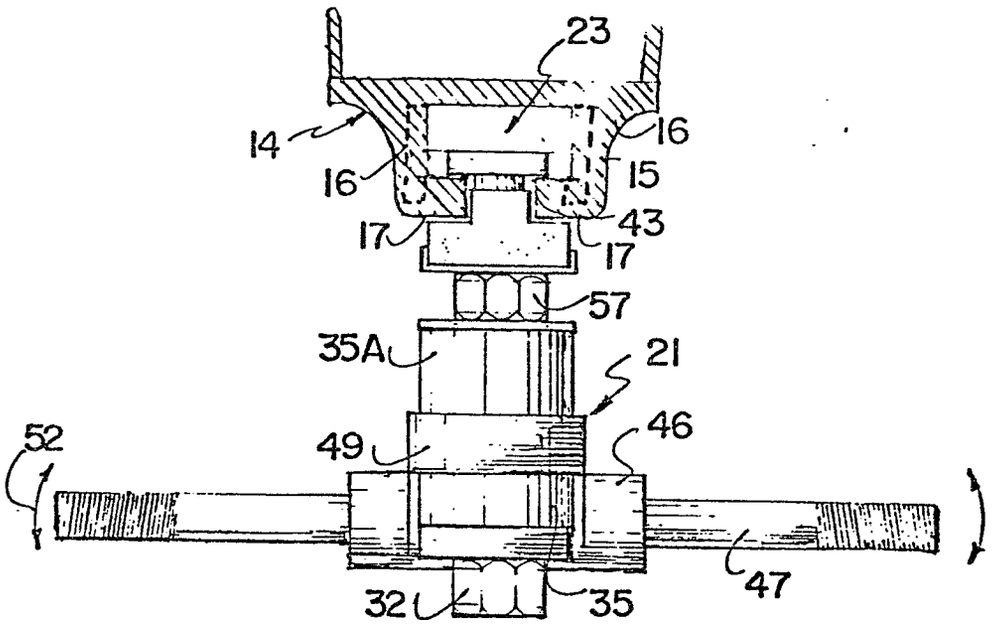
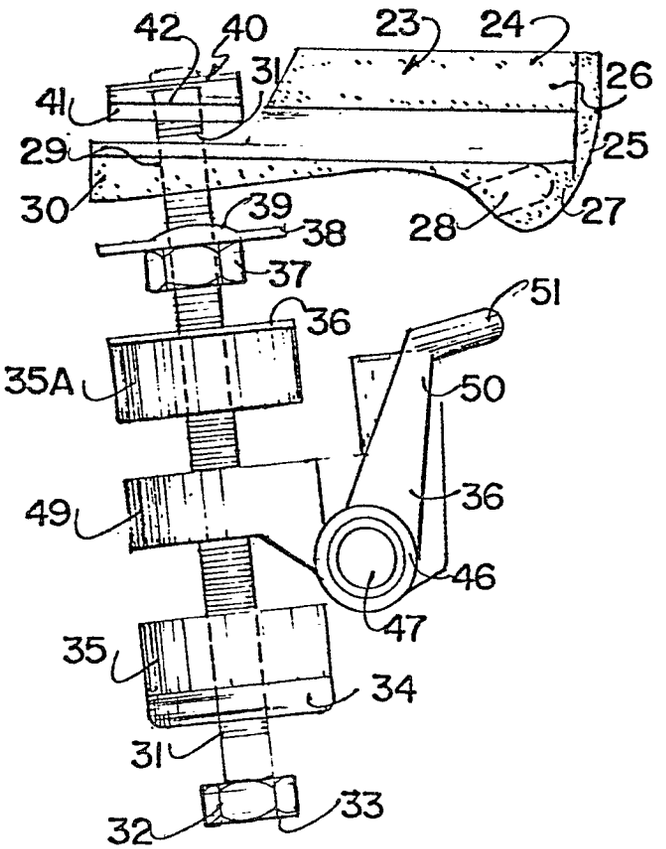

23
14
16
16
15
43
17
17
57
35A
21
52
49
46
47
32
35

FIG. 3


42
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35A
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FIG. 4

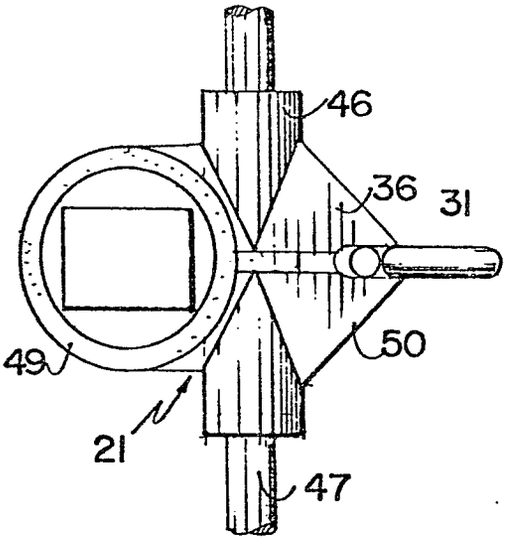

FIG. 6

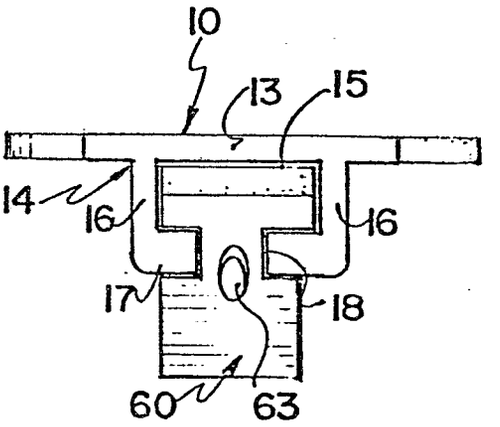

FIG. 8

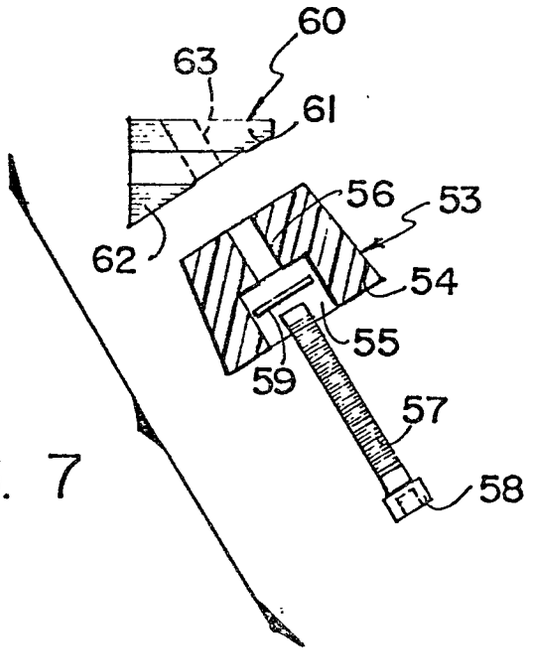

FIG. 7

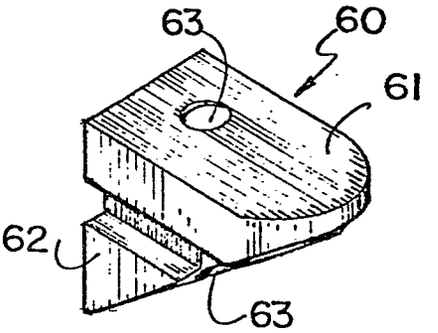

FIG. 9

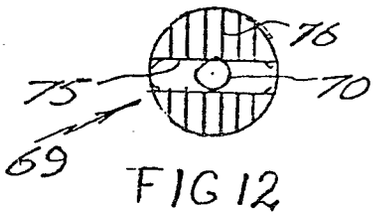

FIG 12

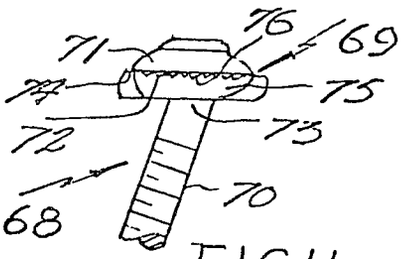

FIG 11

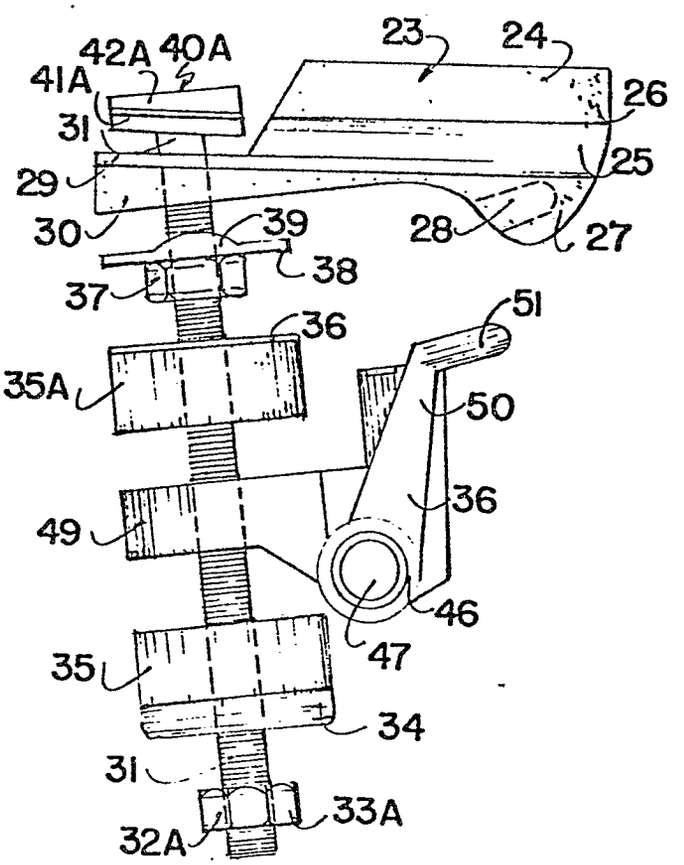

FIG. 10

0032057

European Patent Office

EUROPEAN SEARCH REPORT

Application number
EP 80 30 4738

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
	US - A - 2 696 989 (KLEINMAN) * Complete document *	1-3,6,7,11
	US - A - 4 008 901 (CONN) * Complete document *	1-3,8,10,11
	US - A - 3 953 041 (BUSS) * Column 2, lines 31-50 *	2,3,7
	US - A - 2 941 812 (REYNOLDS) * Column 3, lines 50-69 *	4,6
	US - A - 3 156 482 (WARE) * Column 3, lines 13-38 *	4
A	GB - A - 2 029 704 (CHANG)	
A	FR - A - 2 291 715 (ROTHMAYER)	

CLASSIFICATION OF THE APPLICATION (Int. Cl.³)

A 63 C 17/02

TECHNICAL FIELDS SEARCHED (Int. Cl.³)

A 63 C

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	05-03-1981	SCHLESIER