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(54) Seats of belt or strap type for swings.

(57) A seat of the belt or strap type for a swing has an internal reinforcement in the form of a tough, flexible, peripheral filament or cable (5). The filament or cable resists cutting through the seat with a knife in an act of vandalism and has the advantage of presenting a blunt surface if the seat is cut away to reveal the reinforcement.

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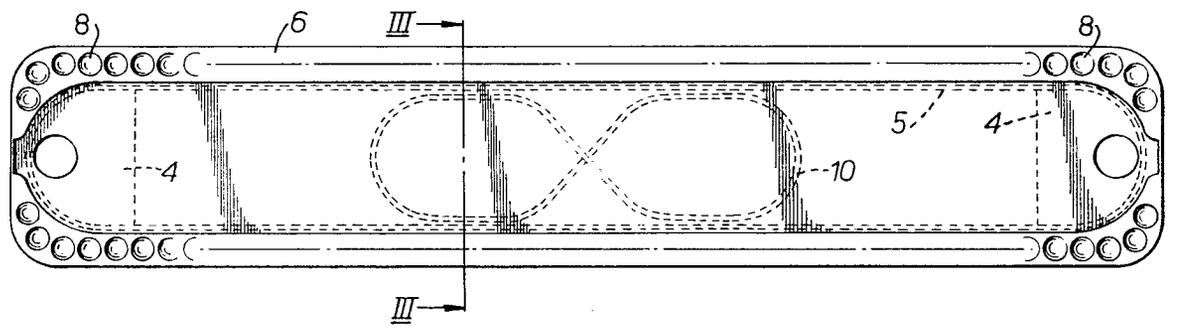

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SEATS OF BELT OR STRAP TYPE FOR SWINGS

This invention relates to seats for swings.

A major difficulty in designing a seat for a swing in a public playground lies in providing a seat which is safe to use but yet able to resist vandalism.

One example of an attempt to solve this difficulty is to be found in British Patent Specification 1,457,271. As described in that specification, a swing seat consists of a platform of synthetic plastics material suspended by chain bolts, having strengthening ribs on its under-surface and formed with a flexible peripheral skirt or lip. The skirt or lip acts as a shock absorber should a child be struck by or run into the seat. The seat, although providing a sufficiently rigid platform on which to sit, is stated to be "somewhat flexible" in order to reduce the risk of damage by vandalism. Since, however, a damaged swing seat can crack but not separate into parts until a child happens to sit on it, the described swing seat is provided with a solid steel reinforcement rod clamped by the chain bolts of the swing seat. Should the seat break in use, the parts will be held together by the reinforcement rod which is itself held by the bolts. Although the swing seat of specification 1,457,271 is described as having a "flexible nature" at one point in the specification and elsewhere as "somewhat flexible", it is apparent that the degree of flexing must actually be very small since the seat is essentially of the rigid platform type. The seat cannot be truly flexible since

the word "flexible" means easily bent or pliable. Indeed, if flexing of the seat were readily possible, cracking, which the construction attempts to avoid, could the more easily be induced by vandals. It may be inferred that the steel reinforcement rod acts to reduce the ease with which vandals can bend the swing seat back and forth to induce cracking.

In Britain, seats for swings are usually in the form of a generally flat rigid member but in U.S.A., for example, the belt or strap form type of seat is popular. The belt or strap form type of seat is essentially a strip of flexible material arranged to be suspended at each of its ends from chains or ropes depending from the frame of the swing and because of its flexibility and inherent lightness is a very safe kind of seat as regards accidents involving impact with the swinging seat. A swing seat in the form of a simple strip of flexible material is, however, an easy target for vandals when provided in a public playground as it can be rapidly destroyed by means of a knife. It has been proposed to make a belt or strap form type of seat which is resistant to vandalism and yet still light and flexible by including within it a sheet of thin metal. The metal prevents the swing seat from being cut through by a knife but unfortunately presents a dangerous edge if the peripheral material of the seat is cut away in an act of vandalism. It has also been found that vandals will destroy such seats by bending them double until the metal reinforcement breaks.

It is an object of the invention to provide a belt or strap form type of seat for a swing which is resistant to vandalism and safe in use.

The present invention provides a seat for a swing comprising a belt or strap which has an internal reinforcement in the form of a tough, flexible, peripheral filament or cable. This construction has the advantage that an ability to resist vandalism is imparted to a belt or strap form type of swing seat without detracting from the inherent safety-in-use of that type of seat.

The seat can include at least one strip of fabric as an internal reinforcement and can comprise resiliently compressible polymeric material moulded about the filament or cable and fabric reinforcement.

The fabric reinforcement can comprise a net fabric.

The filament or cable can have the form of a simple closed loop.

A respective apertured rigid plate means can be provided within the seat at each end thereof, the filament or cable can pass about the plate means and the apertures can define means for making attachment to the swing seat.

Each plate means can comprise two plates which together define a groove in the periphery of the plate means.

Each long side of the seat can be provided with a dependent skirt of a (or the) resiliently compressible

polymeric material defining an outer wall linked to an inner wall by a multiplicity of buckling struts.

The multiplicity of buckling struts can be defined by blind apertures having their longitudinal axes at right angles to the plane the seat defines when flat.

On each long side of the seat the apertures can be arranged in a respective single row.

On each long side of the seat there can be two parallel rows of apertures. The centres of the aperture in one row can be off-set from the centres of the apertures in an adjacent row.

The filament or cable can be a multi-strand cable.

The cable can be of a helical multi-core construction, each core being of multi-strand construction.

The cable can be of metal.

A further tough flexible filament or cable arranged in a loop can be provided as an internal reinforcement in the central area, as considered in plan, of the seat.

The further filament or cable can be arranged in a figure-of-eight configuration.

Two further filaments or cables can be provided, each in the form of a ring, and positioned side-by-side, as considered in plan, of the central area of the seat.

The further filament or cable can be a multi-strand cable.

The further cable can be of a helical multi-core construction, each core being of multi-strand construction.

The further cable can be of metal.

The seat can comprise moulded rubber material in which the other components of the seat are enveloped.

By way of example only, two illustrative embodiments of the invention will now be described with reference to the accompanying drawing, in which:

Figure 1 is a plan view of a first swing seat embodying the invention,

Figure 2 is an underneath view of the swing seat with internal components shown in broken outline,

Figure 3 is a cross-section to a larger scale taken on the line III-III marked in Figure 2, and

Figure 4 is a schematic underneath view of a second swing seat embodying the invention.

Referring to Figure 1, a seat 1 for a swing in the form of a belt or strap comprises a generally rectangular length of resiliently compressible polymeric material 655 millimetres long, 125 millimetres wide and 19 millimetres thick overall.The upper surface of the seat is formed with raised panels 2 approximately 1 millimetre deep to enhance the appearance of the seat and help prevent the user from slipping off the seat. The polymeric material is a blend of natural and polychloroprene rubbers. One hundred per cent polychloroprene is an alternative but a blend of natural and polychloroprene rubbers is capable of giving a better load-bearing characteristic. The rubber has a hardness in the range of from 50 to 60 International Rubber Hardness Degrees.

At each end of the seat 1 there is a respective

aperture 3 to enable the seat to be attached to ropes or chains depending from the frame of the swing. Embedded within the seat 1 are two generally D-shaped apertured steel plate assemblies 4 to reinforce the area about the apertures 3 and withstand the pull from the suspending ropes or chains. Each steel plate assembly 4 comprises two steel stampings spot-welded together which define a groove (not shown) about the arcuate periphery of the 'D'. A steel cable 5 in the form of a simple closed loop passes around the groove in each steel plate assembly 4 and runs from one end of the seat to the other. The cable 5 is approximately 3 millimetres in diameter and comprises six cores arranged helically about a central core, each core being of a multi-strand construction. A cylindrical clamp (not shown) or preferably two for extra security are used to form the cable into a closed loop. The cable bears a part of the load imposed by a user and the seat has sufficient strength to withstand loads imposed by an adult during swinging.

The seat 1 is provided with a peripheral skirt 6 surrounding the inner part 7 which inner part has a thickness of approximately 8 millimetres. The skirt 6 extends approximately 10 millimetres below the under surface of the inner part 7 and on the long side of the seat has a width of approximately 19 millimetres. A multiplicity of blind apertures 8 are provided in two rows, a respective row running along each side of the seat. Each aperture is centrally positioned within the skirt 6, has a diameter

of approximately 7 millimetres and an overall depth of approximately 16 millimetres. The centre-to-centre spacing of each aperture is approximately 8 millimetres so that thin columns of polymeric material are left between the apertures.

Two strips 9 of a synthetic net fabric, such as that known as "leno", of approximately 3 millimetre square gauge are embedded in the seat between the upper surface thereof and the blind ends of the apertures 8. The dimensions of the strips 9 correspond approximately to the width and length of the seat 1.

A further loop of cable 19 twisted into a figure-of-eight configuration is embedded in the seat 1 and extends over approximately the middle third thereof. The cable 10 is again of multi-core, multi-strand construction but has a diameter of approximately 2 millimetres.

The seat is constructed by "sandwiching" the internal components in the order fabric/metal components/fabric between two sheets of the polymeric material and subjecting the whole to compression moulding. The cables and steel plate assemblies are pre-treated prior to moulding with a bonding agent but this is not necessary in the case of the fabric strips 9.

The cable 5 provides a tough, flexible, internal reinforcement around the periphery of the seat 1 and will resist an attempt to cut through the seat with a knife. It has the advantage of presenting a blunt surface if the skirt 6 is cut away and furthermore is relatively light

and inexpensive. The cable 10 has like advantages and protects the central area of the seat from attempts to slash through it, particularly in a longitudinal direction. The multi-strand construction of the cables resists an attempt to break them by bending the seat double. It is preferred to use metal for the cables but it would be possible to employ a plastics material such as nylon although the resistance to cutting would not be so good. A thick filament could be used in place of a cable.

The thin columns between the apertures 8 act as buckling struts and provide a safety characteristic in impact as described in our earlier patent No. 1,535,728. If desired, more than one row of apertures can be provided in the skirt 6.

The strips 9 provide an internal reinforcement for the seat 1 and help the polymeric material retain its dimensional stability, particularly in a cross-wise direction, under the weight of a user. The net fabric is advantageous in bonding well to the polymeric material but some other material such as cotton or synthetic duck could be used if pre-treated to enhance bonding. The plate assemblies provide a relatively inexpensive means of both strengthening the attachment points of the seat and positioning the cable 5. The plate assemblies could alternatively be fabricated each in one piece from a plastics material.

The enveloping polymeric material makes the seat resistant to deterioration tending to result from in-

stallation out of doors and the specified rubber is moreover not a flammable material. Other polymeric materials could, however, be used alternatively.

A second swing seat embodying the invention is shown in Figure 4 and is generally similar to the swing seat described with reference to Figures 1 to 3. Corresponding parts are indicated by the use of identical but primed reference numerals and will not in general be described again. In the swing seat shown in Figure 4, the cable 10 protecting the central area of the seat in the Figures 1 to 3 embodiment is replaced by two spaced-apart separate cables 10A and 10B each in the form of a closed ring. The function of the cables 10A and 10B is essentially the same as that of the cable 10 but manufacture is simplified by avoiding the need to make a figure-of-eight configuration. The single rows of apertures 8 of the Figures 1 to 3 embodiment is replaced in Figure 4 by double rows of apertures 8' to give additional safety in use. The centres of the apertures in one row are off-set from the centres of the apertures in the adjacent row but this feature is not essential. The Figure 4 swing seat otherwise corresponds to the Figures 1 to 3 swing seat except that the length/width has been changed and the apertures 3 replaced by slightly larger apertures 3'.

What we claim is:

1. A seat (1) for a swing comprising a belt or strap which has an internal reinforcement (5), characterised in that the internal reinforcement is in the form of a tough, flexible, peripheral filament or cable (5).

2. A seat as claimed in claim 1, including at least one strip of fabric (9) as an internal reinforcement and comprising resiliently compressible polymeric material moulded about the filament or cable (5) and fabric reinforcement.

3. A seat as claimed in claim 2, wherein the fabric reinforcement (9) comprises a net fabric.

4. A seat as claimed in any preceding claim, wherein the filament or cable (5) has the form of a simple closed loop.

5. A seat as claimed in claim 4, wherein a respective apertured rigid plate means (4) is provided within the seat at each end thereof, the filament or cable (15) passes about the plate means and the apertures define means for making attachment to the swing seat.

6. A seat as claimed in claim 5, wherein each plate means comprises two plates (4) which together define a groove in the periphery of the plate means.

7. A seat as claimed in any preceding claim, wherein each long side of the seat is provided with a dependent skirt (6) of a (or the) resiliently compressible polymeric material defining an outer wall linked to an inner wall by a multiplicity of buckling struts.

8. A seat as claimed in claim 7 wherein the multiplicity of buckling struts are defined by blind apertures (8) having their longitudinal axes at right angles to the plane the seat defines when flat.

9. A seat as claimed in claim 8, wherein on each long side of the seat the apertures (8) are arranged in a respective single row.

10. A seat as claimed in claim 8, wherein on each long side of the seat there are two parallel rows of apertures (8').

11. A seat as claimed in claim 10, wherein the centres of the apertures (8') in one row are off-set from the centres of the apertures (8') in an adjcent row.

12. A seat as claimed in any preceding claim, wherein the filament or cable (5) is a multi-strand cable.

13. A seat as claimed in claim 12, wherein the cable (5) is of a helical multi-core construction, each core being of multi-strand construction.

14. A seat as claimed in claim 12 or 13, wherein the cable (5) is of metal.

15. A seat as claimed in any preceding claim, wherein a further tough flexible filament or cable (10) arranged in a loop is provided as an internal reinforcement in the central area, as considered in plan, of the seat.

16. A seat as claimed in claim 15, wherein the further filament or cable (10) is arranged in a figure-of-eight configuration.

17. A seat as claimed in claim 15, wherein two further filaments or cables (10A,10B) are provided, each in the form of a ring, and positioned side-by-side, as considered in plan, of the central area of the seat.

18. A seat as claimed in any of claims 15 to 17, wherein the or each further filament or cable (10A, 10B) is a multi-strand cable.

19. A seat as claimed in claim 18, wherein the or each further cable (10; 10A, 10B) is of a helical multi-core construction, each core being of multi-strand construction.

20. A seat as claimed in claim 19, wherein the or each further cable (10; 10A, 10B) is of metal.

21. A seat as claimed in any preceding claim, wherein the seat comprises moulded rubber material in which the other components of the seat are enveloped, with regard to claim 2 or 7 the moulded rubber material constituting the resiliently compressible polymeric material.

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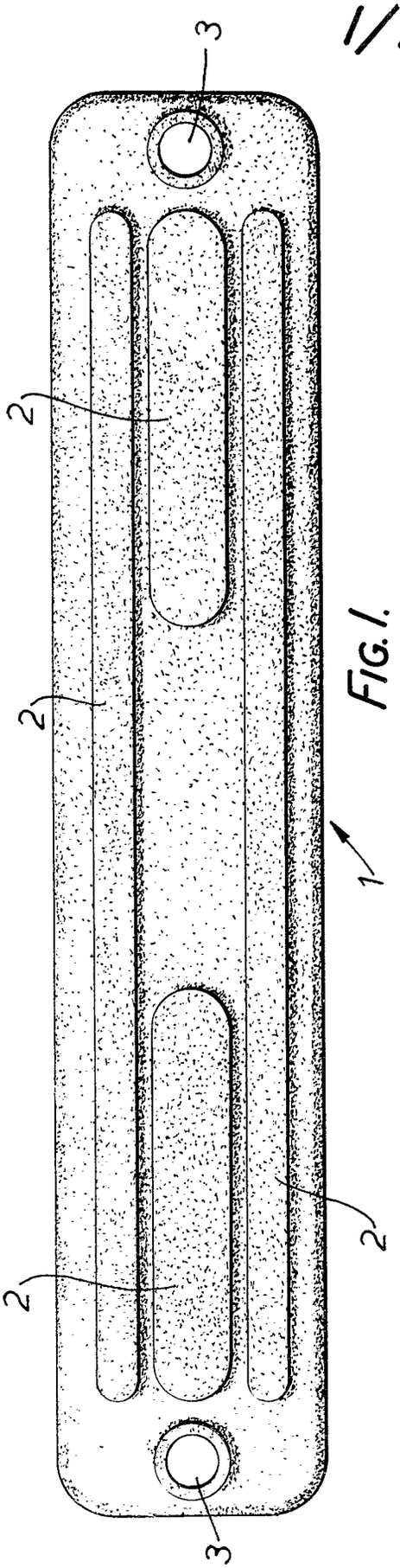

FIG. 1.

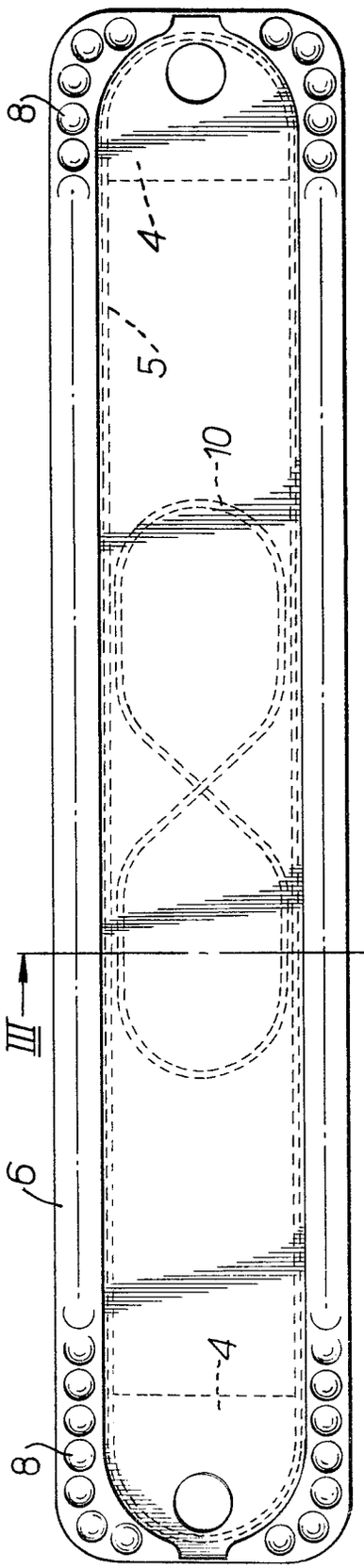

FIG. 2.

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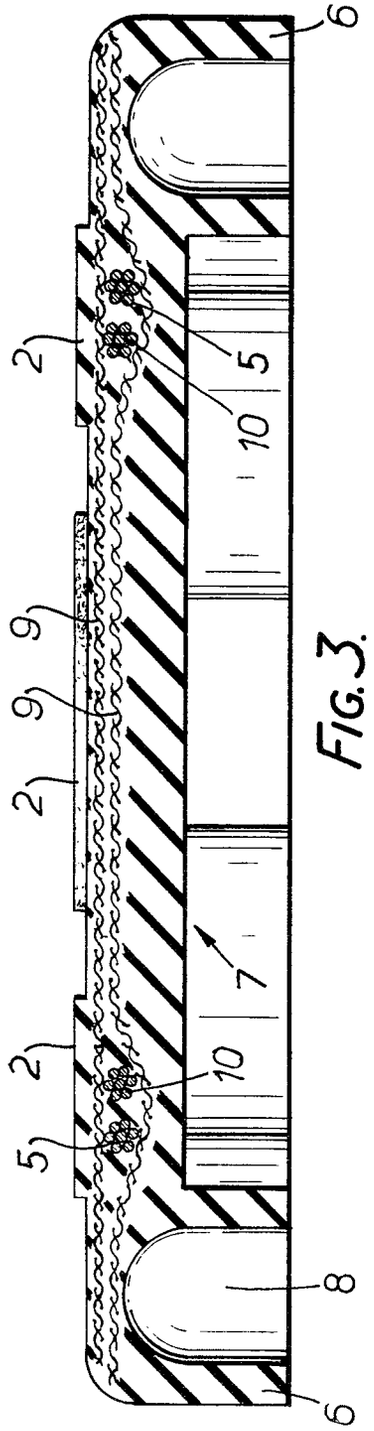

FIG.3.

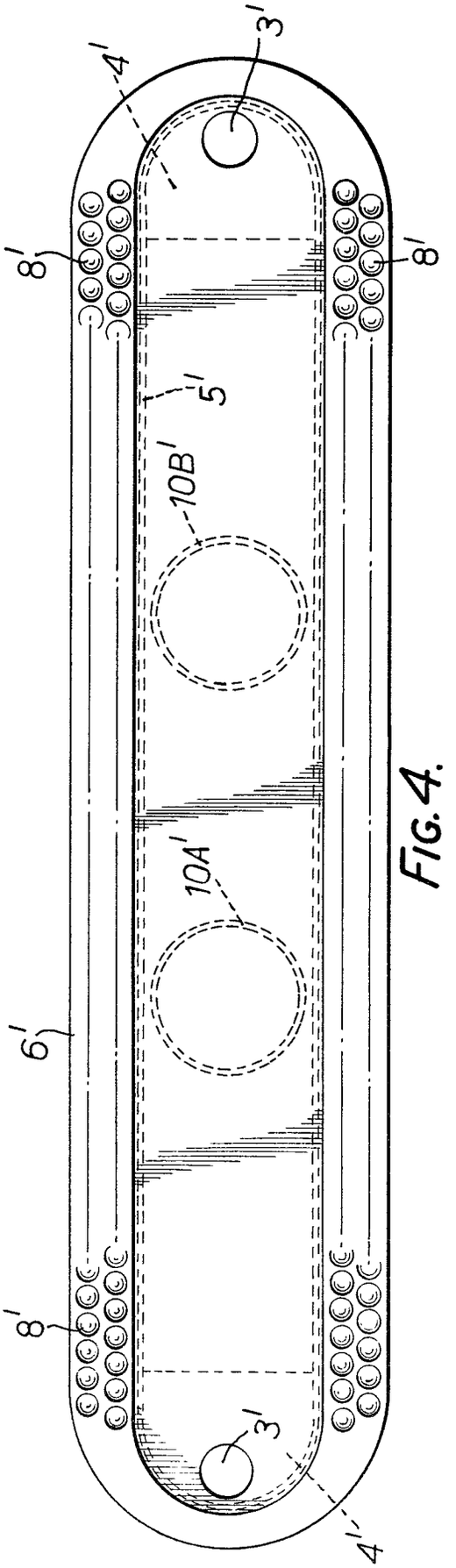

FIG.4.

European Patent Office

EUROPEAN SEARCH REPORT

0027035
Application number
EP 80 30 3477

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
	US - A - 3 897 056 (TURCO MANUFACT.) * Column 1, lines 34-38, 57-67; column 3, lines 20-27; figures 2,3 *	1,4,5, 14,21
D	GB - A - 1 457 271 (WICKSTEED) * Page 1, lines 23-28, 33-38, 55-63; figures 1,3,6 *	1,4,7, 14,21
P	GB - A - 2 040 697 (THOMAS) * Page 1, lines 35-42, 86-90; figure *	1,3-5
A	GB - A - 1 535 728 (SUTCLIFFE)	

CLASSIFICATION OF THE APPLICATION (Int. Cl.³)

A 63 G 9/00

TECHNICAL FIELDS SEARCHED (Int. Cl.³)

A 63 G
A 47 D

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

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14-01-1981	GERMANO

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