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

(11) Publication number: **0 399 472 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **90109714.7**

(51) Int. Cl.5: **E05F 1/12**

(22) Date of filing: **22.05.90**

(30) Priority: **26.05.89 GB 8912229**

(43) Date of publication of application:
28.11.90 Bulletin 90/48

(84) Designated Contracting States:
BE DE DK ES FR GB IT NL

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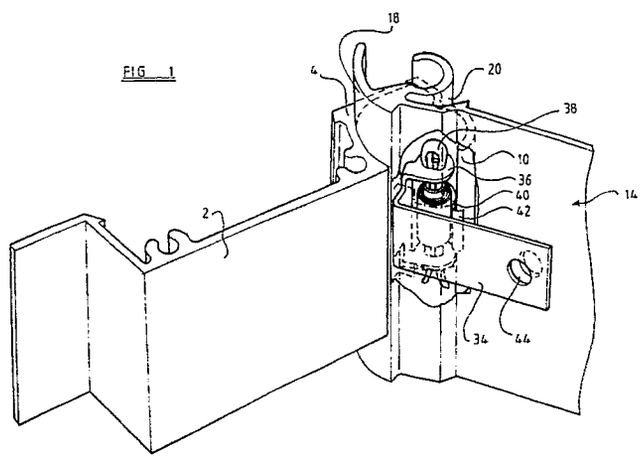
(54) Door assemblies.

(57) A door assembly comprises a door frame (2) comprising a hinge formation (4) providing a concave-curved surface (6), and a complementary hinge formation (16) providing a convex-curved outer surface (18) which may be engaged with the hinge formation (4) to allow pivotal movement of the door relative to the frame about an axis, with the surface (6) and (18) being in sliding engagement. Door closing mechanism (30) comprises a bracket (32) having an outer flange (34) and spaced parallel arms (36) between which a split pin (38) extends. Mounted around the split pin (38) is a coil spring (40), an inner end of which being located between the legs of the split pin, an outer hooked end (42) of the coil spring being located against a lip (10) of the hinge formation (4). The force tending to uncoil the spring is operative to urge the door to its closed position. Should the need arise to replace the coil spring, the door closing mechanism (30) may simply be removed, allowing a fresh coil spring to be inserted.

FIG 1



EP 0 399 472 A1

Door assemblies

This invention is concerned with improvements relating to door assemblies. The invention has been devised particularly in relation to the provision of a simple but reliable door closing mechanism for a door assembly of the kind commonly found in locker rooms. It is however to be appreciated that the door closing mechanism the subject of this invention may be utilised for doors in general terms, such as cupboard doors.

According to this invention there is provided a door assembly comprising a frame, a door pivotally mounted on the frame, and door closing mechanism, the door closing mechanism comprising a coil spring releasably mounted on the door and having an end portion releasable cooperating with the frame to urge the door closed.

Preferably the coil spring is located on or closely adjacent to the axis about which the door rotates, on movement thereof between its open and closed positions.

Preferably the construction and arrangement is such that the door closing force is exerted as a force tending to cause the spring to unwind.

In this manner the spring may be retained relatively fully wound, and hence compact.

Preferably the closing mechanism comprises a support member, including a spindle on which the spring is coiled, and a flange adapted to be secured to the door e.g. by the use of a screw.

Conveniently the spindle is in the form of a split pin, between the legs of which one (inner) end of the spring is conveniently located.

Preferably the frame comprises a hinge formation providing a concave-curved surface and the door comprises a complementary hinge formation providing a convex-curved surface adapted to seat against that of the hinge formation of the frame.

Preferably a substantial part at least of the coil spring is located within the circumferential boundry of the hinge formation, and preferably the axis of the coil spring is located close to (i.e. within 10 mm of, and preferably within 2 mm of) the axis of closing movement of the door. In this manner a compact construction of door closing mechanism may be obtained.

Preferably the hinge formation of both the frame and the door are axially elongate, and conveniently the hinge formation of the door is cut-away to enable location of the coil circumferentially within the boundries of the hinge formation thereof.

There will now be given a detailed description, to be read with reference to the accompanying drawings, of a door assembly which is a preferred embodiment of this invention, having been selected for the purposes of illustrating the invention by way of example.

In the accompanying drawings:

FIGURE 1 is a schematic perspective view, showing part of a door frame of the assembly, a door thereof, and hinge mechanism therefor;

FIGURE 2 is a plan view taken on Figure 1, showing the door in a closed position;

FIGURE 3 is a view corresponding to Figure 2 showing the door in an open position; and

FIGURE 4 is a view of part of the door frame, showing the cut-away mounting of the door closing mechanism.

The door assembly which is the preferred embodiment of this invention comprises a door frame 2 comprising a hinge formation 4 providing a concave-curved surface 6, an opening 8 being provided into the interior of the hinge formation, said opening being bounded on one edge on a lip 10.

Also located within the hinge formation is a secondary convex bearing surface 12, having a centre closely adjacent to that of the surface 6.

The door 14 comprises a complementary hinge formation 16 providing a convex-curved outer surface 18, which together with a secondary convex bearing surface 20 may be engaged within the hinge formation 4 to allow pivotal movement of the door relative to the frame about (in use) a vertical axis, the surfaces 6 and 18 being in sliding engagement, together with the surfaces 12 and 20.

Provided in the door 14, opening through the hinge formation 16 is a recess 22, adjacent to which is a bore 24.

The door closing mechanism of the preferred embodiment, indicated by the general reference numeral 30, comprises a bracket 32 having an outer flange 34, and spaced, parallel arms 36 between which a spindle, in the form of a split pin 38, extends. Mounted around the spindle 38 is a coil spring 40, an inner end of which being located between the legs of the split pin, and the outer end thereof being provided with a hook formation 42.

Provided in the flange 34 is a bore 44.

In the assembly of the door, door frame and door closing mechanism, the hinge formation 16 of the door is located within the hinge 4 of the door frame, allowing arcuate movement of the door relative to the frame about a longitudinal axis, between an open and closed position of the door.

With the door in its fully open position, to present access to the recess 22, the arms 36 of the bracket 32, together with the coil spring carried thereby, are moved into the recess 22 within the peripheral confines of the concave-curved surface 6 of the door hinge formation, and the hooked outer end 42 of the coil spring is located against

the lip 10 of the formation 4. The door closing mechanism is located further within the confines of the surface 6, and the flange 34 is pressed against the door frame, with the bore 44 in alignment with the bore 24, the flange being secured to the door frame by the use of a rivet (not shown). In this position the coil spring is located substantially on the longitudinal axis of door closing movement i.e. within 2 mm of said axis, and the force tending to uncoil the screw is operative to urge the door to its closed position, shown in Figure 2.

Should the need arise to replace the coil spring, the door closing mechanism 30 may simply be removed by removal of the screw, and angling the door so that the mechanism 30 may be removed from the hinge mechanism, the split pin removed and a fresh coil spring replaced thereon, for reassembly with the door.

The features disclosed in the foregoing description, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, or a class or group of substances or compositions, as appropriate, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

Claims

1. A door assembly comprising a frame (2), a door (14) pivotally mounted on the frame, and door closing mechanism (30), the door closing mechanism comprising a coil spring (40) releasably mounted on the door and having an end portion releasable cooperating with the frame (2) to urge the door (14) closed.

2. A door assembly according to Claim 1 wherein the coil spring (40) is located on or closely adjacent to the axis about which the door rotates, on movement thereof between its open and closed positions.

3. A door assembly according to one of Claims 1 and 2 wherein the construction and arrangement is such that the door closing force is exerted as a force tending to cause the spring to unwind.

4. A door assembly according to any one of the preceding claims wherein the closing mechanism comprises a support member, including a spindle (38) on which the spring is coiled, and a flange (34) adapted to be secured to the door.

5. A door assembly according to Claim 4 wherein the spindle (38) is in the form of a slit pin, between the legs of which one end of the spring (40) is located.

6. A door assembly according to any one of the preceding claims wherein the frame (2) comprises a hinge formation (4) providing a concave-curved surface (6) and the door comprises a complementary hinge formation (16) providing a convex-curved surface (18) adapted to seat against that of the hinge formation of the frame.

7. A door assembly according to Claim 6 wherein a substantial part at least of the coil spring (40) is located within the circumferential boundry of the hinge formation.

8. A door assembly according to Claim 7 wherein the axis the coil spring is located within 10 mm of the axis of closing movement of the door.

9. A door assembly according to any one of Claims 6, 7 and 8 wherein the hinge formation (4, 16) of both the frame (2) and the door (14) are axially elongate.

10. A door assembly constructed and arranged substantially as hereinbefore described with reference to the accompany drawings.

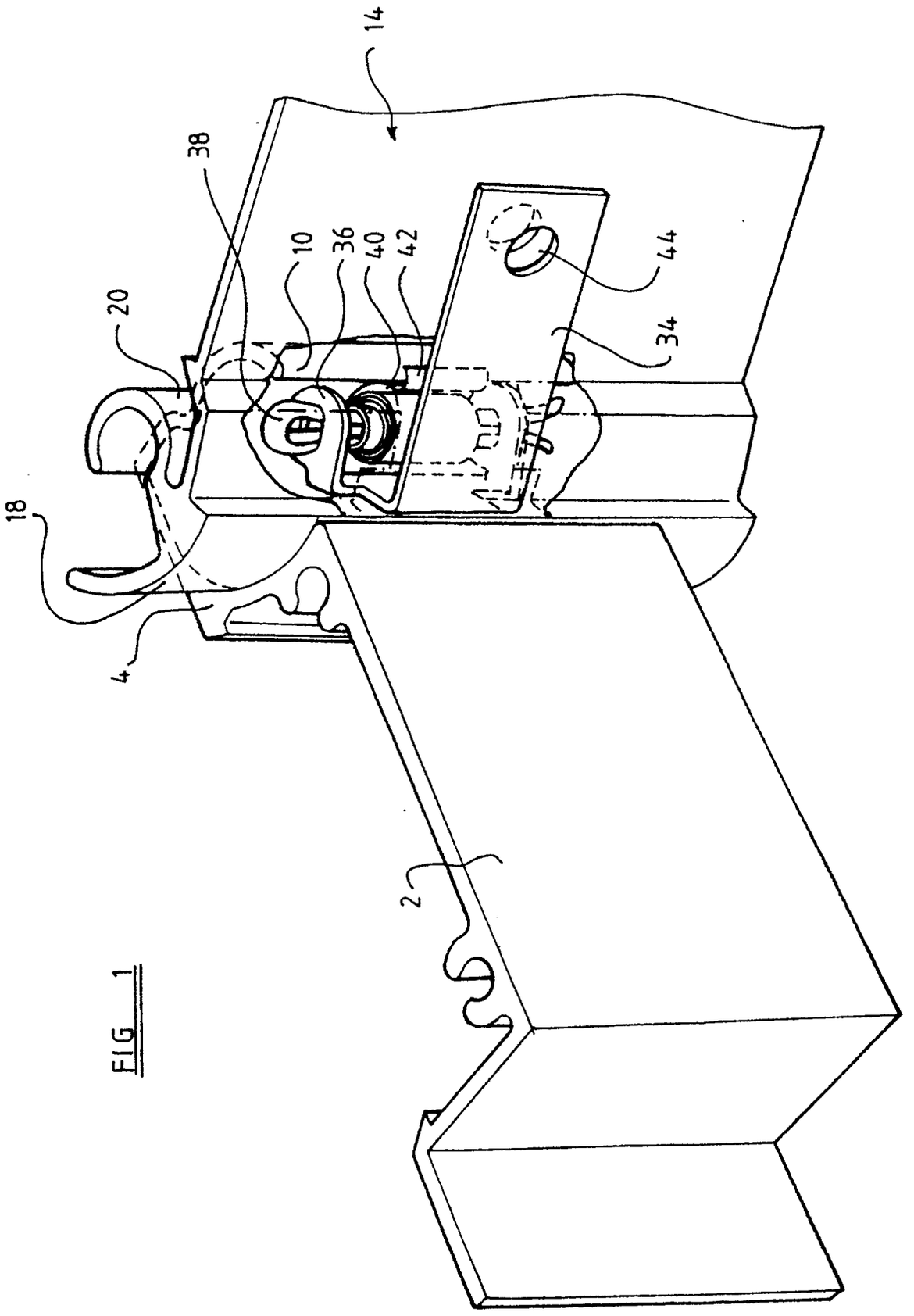


FIG 1

FIG 2

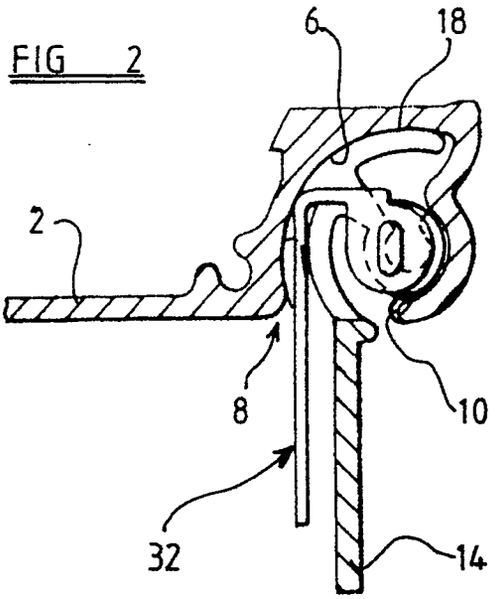


FIG 3

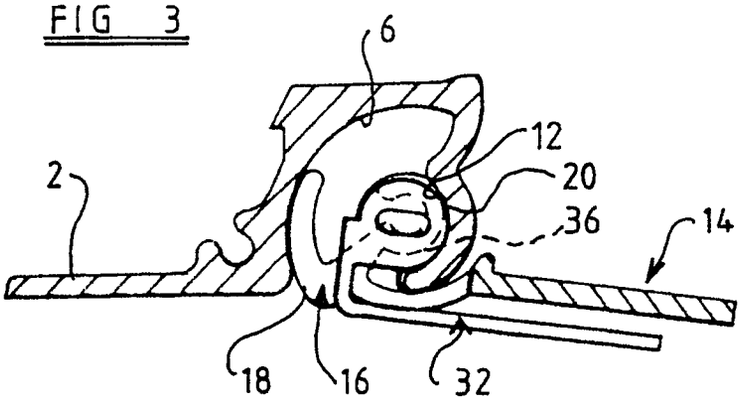
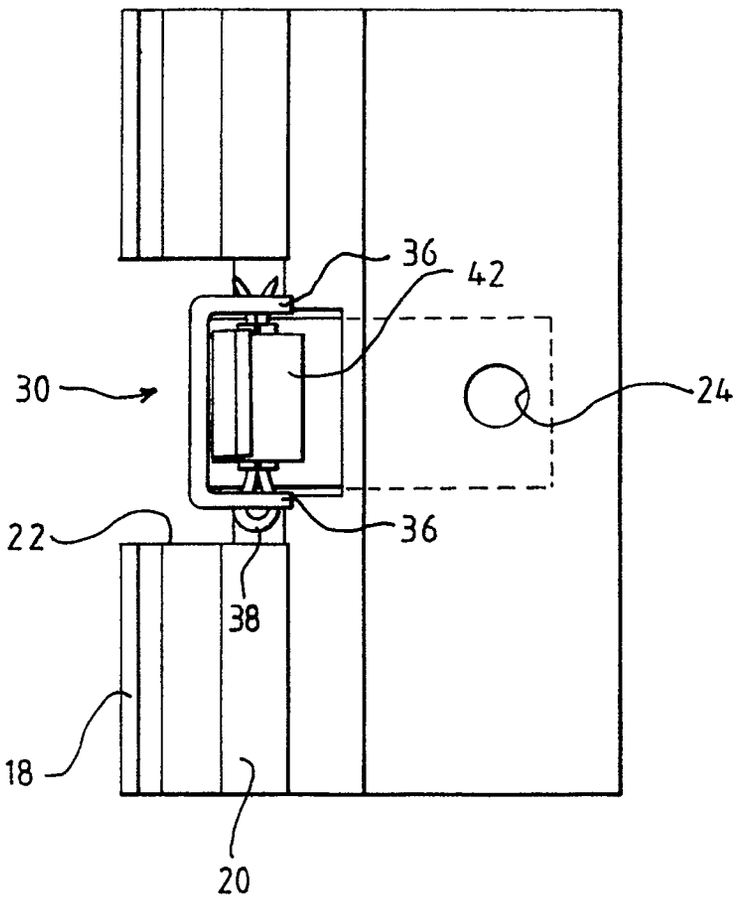


FIG 4



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EUROPEAN SEARCH REPORT

Application Number

EP 90 10 9714

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)
Y	GB-A-2 133 831 (GOIOT) * Page 2, lines 4-5,38-41; figures 1,3 * ---	1-3	E 05 F 1/12
Y	FR-A-1 444 727 (LICENTIA PATENT-VERWALTUNGS GmbH) * Page 1, column 1, lines 1-5,37-38; page 1, column 2, lines 1-5,13-26; page 2, column 1, line 27 - page 2, column 2, line 4; figures 1,2 * ---	1-3	
A		4,6-9	
A	GB-A-1 603 194 (KATO ELECTRIC AND MACHINARY) * Page 1, lines 34-51,82-86; page 2, lines 4-10; figures 1-3A * ---	2,4	
A	US-A-2 442 177 (RILEY et al.) * Column 1, lines 55-56; figures 1,2,4 * ---	5	
A	MOTOROLA TECHNICAL DEVELOPMENTS, vol. 1, no. 1, August 1980, page 31, Schaumburg, Illinois, US; G. SELINKO: "Simplified biased hinge assembly" * Figure 1 * ---	3,6-9	TECHNICAL FIELDS SEARCHED (Int. Cl.5) E 05 F
A	US-A-4 475 268 (LABELLE) * Column 2, line 62 - column 3, line 3; figure 1 * -----	6,9	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	01-08-1990	GUILLAUME G.E.P.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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