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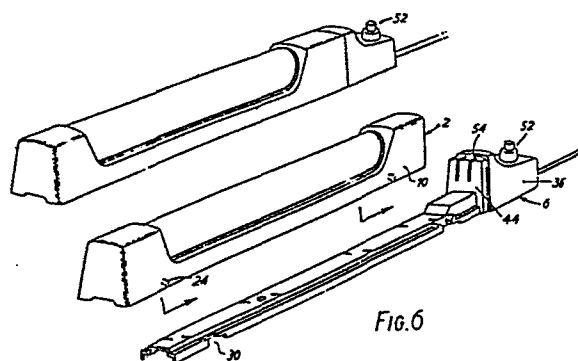
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54 **Lighting unit.**

57 A lighting unit comprises a cartridge 2 retaining a double ended strip light 4, and a cartridge holder 6. The cartridge 2 has terminals (not shown) projecting at one end for engagement in supply socket openings 54 of the holder. The holder is secured to, for example, a wall and the cartridge is engaged with the holder as follows:

Projections (not shown) provided on the inside of the cartridge are engaged in slots 30 formed in the holder. The cartridge may then be slid along the holder to its installed position and the terminals thereby engage within the socket openings 54.

Elements may be safely replaced because all live terminals are shielded from touch.



LIGHTING UNIT

This invention relates to lighting units of the type having a double ended straight, elongate lighting element such as a tubular tungsten or tungsten halogen lamp. A double ended lighting element is one in which
5 an electrical connection is made to each end. The invention relates in particular to a lighting unit of this type into which an element may conveniently and safely be inserted.

With some of the lighting units widely used at
10 present there is a risk to a person inserting a new element. Should the power supply be left on and the person introduce one end of the element to the live terminal of the unit whilst holding the other end he may complete an electrical circuit and receive an
15 electric shock. To combat this risk the use of warning labels on such lighting units is recommended. This remedy is clearly unsatisfactory in view of the hazard involved.

According to the present invention there is
20 provided a lighting unit comprising a cartridge holder having socket openings containing electrical contacts and a cartridge for engagement with the cartridge holder, the cartridge comprising a straight, tubular lighting element and a lighting element holder having
25 terminals in electrical contact with the lighting element and arranged for engagement with the contacts, wherein the cartridge and cartridge holder are provided with co-operating means such that the cartridge can be moved with respect to the cartridge
30 holder in a generally lengthwise direction to secure the cartridge to the cartridge holder and connect the terminals to the contacts, the terminals being shielded when the cartridge is positioned for engagement with the cartridge holder.

Preferably the co-operating means constrains the cartridge to move lengthwise between a retracted position in which the cartridge can be disengaged from the holder by movement transverse to its length and an
5 installed position in which the terminals are connected with the contacts and from which the cartridge can only be moved towards its retracted position.

The co-operating means may comprise a projection carried by the cartridge holder or the lighting element
10 holder, slidable within a slot formed on the other part, the slot having an introduction opening at one end, to receive the projection. The opening may have a lead-in surface to guide the projection into the slot. The slot may be on either the cartridge or the
15 cartridge holder, and the projection on the other part; in a preferred embodiment a plurality of slots on the cartridge holder are engageable with a corresponding number of projections on the lighting element holder of the cartridge. Thus, the cartridge holder may have a
20 first pair of slots transversely spaced from one another, adjacent the contact end of the cartridge holder, and a second pair of slots, transversely spaced from one another, adjacent the other end of the cartridge holder, the lighting element holder having
25 four projections for respective engagement in the slots. In one such arrangement which provides particularly positive and easy engagement and disengagement one pair of slots has a pair of upwardly directed guiding shoulders associated with the openings of the slots and
30 the other pair of slots has no upstanding projections associated with its openings.

It is preferred that the co-operating means is adapted to support the weight of the cartridge so that the terminals of the cartridge carry substantially none
35 of the weight thereof in the installed position.

In a preferred embodiment a pair of guiding surfaces is provided about each socket opening to guide the cartridge terminals into the socket openings when the cartridge is slid from its retracted to its
5 installed position.

The terminals preferably project from one end of the cartridge.

Commonly the cartridge holder has an elongate base member for securement to a wall and the lighting
10 element holder has portions for engagement along the transverse edges of the base member.

The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:

15 Fig. 1 shows in perspective view a first embodiment of assembled lighting unit according to the invention;

Figs. 2 and 3 show in perspective view a cartridge and a cartridge holder which engage together
20 to provide the lighting unit of Fig. 1:

Fig. 4 shows in perspective view the end of the cartridge shown in Fig. 2 carrying the electrical terminals for the cartridge.

Fig. 5 shows in expanded perspective view an
25 engagement slot of the cartridge holder of Fig. 3 and an inter-engagable projection on the cartridge;

Fig. 6 shows in perspective view a second embodiment of lighting unit according to the invention.

Fig. 7 is an expanded view of a rear engagement
30 slot of the cartridge holder of Fig. 6, and the inter-engagable projection of the cartridge; and

Fig. 8 is an expanded view of a front engagement slot of the cartridge holder of Fig. 6.

With reference to Figs. 1 to 5, the assembled
35 lighting unit comprises: a cartridge 2 comprising a strip lighting element 4 and a lighting element holder

5; and a cartridge holder 6. The lighting element holder 5 and the cartridge holder 6 are moulded plastics articles.

5 The lighting element holder 5 may be considered as a channelled member cut away in its middle region to leave channelled end portions 8 and 10, joined by a pair of thin, parallel strips 11. Each end portion comprises opposed side walls 12 and 14 and an inter-connecting web 16. The strips 11 join the parts of the
10 side walls 12 and 14 remote from the respective webs.

Each end portion 8 and 10 has a U-shaped, insulating spring clip (not shown) secured to the inner surface of the web. The clips grip the ends of the element 4 to retain it firmly within the lighting
15 element holder 5, with the end terminals of the element in contact with leaf spring contacts (also not shown). Both the input terminals 20 and 22 to the cartridge 2 are at one end 10 of the lighting element holder 5 (see Fig. 4). One leaf spring contact is connected directly
20 to the adjacent terminal 20 and the other is connected to the other terminal 22 via wiring trained along the inner surface of one of the strips 11.

A cylindrical projection 24 is on the inner surface of each side wall 12 and 14 of each end 8 and
25 10, adjacent the free edge of the side wall (that is, remote from the web). The projections 24 form two pairs and the projections of each pair generally oppose each other across the channel of a respective end portion 8, 10. One projection is shown in Fig. 5.

30 The cartridge holder 6 has a base strip 26 which is slightly narrower than the width of the channel of the cartridge. The base strip 26 comprises a central portion 27 with downturned edges 28 extending along its length. The central portion 27 carries a reflective
35 strip.

Each edge 28 is formed with two identical slots 30. The slots form two pairs transversely aligned across the base strip. Each slot is generally L-shaped, having a transverse opening 32 sufficiently wide to enable a projection 24 to pass through it, and a portion formed longitudinally along the edge 28 and leading to an abutment face or blind wall 34.

One end of the base strip 26 joins a housing 36 which contains electrical contacts with which the input terminals 20 and 22 of the plug member can connect. The electrical contacts are connected to a mains lead 38. The housing 36 has a shaver socket 40 and a cord pull switch 42.

Slit-shaped socket openings are provided in the end 44 of the housing 36 which faces the base strip 26. Three spaced apart mutually parallel guide plates 46 extend from the end 44, one between the socket openings and the others on either side of the openings. Thus, two gaps are provided in alignment with the socket openings. In other embodiments for plates could of course be used to provide the two gaps, two plates being located between the socket openings.

The outer surface of the housing 36 is identical in profile to the outer surface of the end portion 10 of the cartridge except for a shoulder portion 48 adjacent the end 44. The outer surface of this shoulder portion 48 is identical in profile to the inner surface of the end portion 10. Thus, when the cartridge and cartridge holder are engaged together the end portion 10 fits snugly over the shoulder portion 48 and the outer surface of the assembled lighting unit extends smoothly from the end portion 10 to the housing 36.

For use, the cartridge holder 6 is horizontally secured in a desired position, most commonly to a wall. For this purpose the base strip 26 has screw holes 49

and spacers (not shown) are located beneath the screw holes to prevent the central portion 27 of the base strip being deformed towards the wall.

5 To engage the cartridge with the cartridge holder the former is introduced onto the latter by moving it in a direction generally perpendicular to its axis. The projections 24 are aligned with and pass through the openings 32 of the slots 30 and the terminals 20 and 22 each pass within the appropriate gap between the
10 guide plates 46. The side walls 12 and 14 of the ends 8 and 10 and the strips 11 of the cartridge fit snugly over the edges 28 of the base strip 26. The cartridge is then slid towards the housing 36. The projections slide within the slots 30 and the inner surface of the
15 end portion 10 slides over the shoulder portion 48. The terminals 20 and 22 are guided into the socket openings and into electrical contact with the contacts within the housing. The lighting unit is now ready for use. Even if the power is left on during this
20 installing procedure there is no danger to the observer as all live terminals are completely shielded and cannot be touched.

It will be appreciated that the slots 30 are short in relation to the length of the unit so that the unit
25 can be installed in places of restricted width.

When the unit is in its assembled condition the cartridge is secure on the cartridge holder and is restrained against movement transverse to its length. The weight of the cartridge is supported by the
30 interengaging structure of the two parts and the terminals 20 and 22 bear none of the weight. The only direction in which it can be moved is away from the housing, and in so doing, the terminals of the cartridge are disconnected from the electrical supply.

35 To replace a spent element the cartridge is simply slid away from its installed position adjacent the

housing until it reaches its fully retracted position at which it can slide no further, as a result of the abutment of the projections 24 with the ends 50 of the slots, which ends are remote from the housing. In this
5 retracted position the cartridge 2 is electrically isolated from the cartridge holder. The cartridge is now free to move transversely to its length, by pulling it away from the cartridge holder and allowing the projections 24 to pass through the openings 32.
10 The cartridge is now completely free of the cartridge holder and the element can be replaced.

The second embodiment of lighting unit shown in Figs. 6 to 8 has an identical cartridge 2 to that of Fig. 1 but a modified cartridge holder 6.

15 The second embodiment does not have a shaver socket, and a push button switch 52 is provided instead of a cord pull. The profile of the end of the housing 36 which is to adjoin the end portion 10 of the cartridge matches the profile of the cartridge but the
20 other end of the housing is of cut-away profile.

The end 44 of the housing again has socket openings 54 into which the terminals of the cartridge must pass but the socket openings 54 are wider than those of the first embodiment and no guide plates are
25 used.

A further difference is in the region of the openings of the slots 30. The rear slots (one of which is shown in Fig. 7), are each approached by an inclined lead-in surface 56 to guide the projection 24 into
30 opening 32 and thence into the longitudinal portion of the slot. The lead-in surfaces thus form ramps dropping towards the abutment face 34 and when the projections are moved down these ramps the cartridge is moved transversely (but not perpendicularly) to the
35 axis of the lighting element. In contrast, the front pair of slots (one of which is shown in Fig. 8) is

associated with a pair of upwardly projecting guiding
shoulders 58. Each has an inclined surface 60 leading
to the opening 32 and it will be apparent that the
projection 24 will be easily guided into the opening
5 even if the cartridge is initially located on the
cartridge holder somewhat inaccurately. The avoidance
of upwardly projecting parts adjacent the openings of
at least one of the pairs of slots - here the rear
pair - helps to provide easy and trouble-free engagement
10 and disengagement.

CLAIMS

1. A lighting unit comprising a cartridge holder having socket openings containing electrical contacts and a cartridge for engagement with the cartridge holder, the cartridge comprising a straight, elongate,
5 double ended lighting element and a lighting element holder having terminals in electrical contact with the lighting element and arranged for engagement with the contacts, wherein the cartridge and cartridge holder are provided with co-operating means such that the
10 cartridge can be moved with respect to the cartridge holder in a generally lengthwise direction to secure the cartridge to the cartridge holder and connect the terminals to the contacts, the terminals being shielded when the cartridge is positioned for engagement with
15 the cartridge holder.

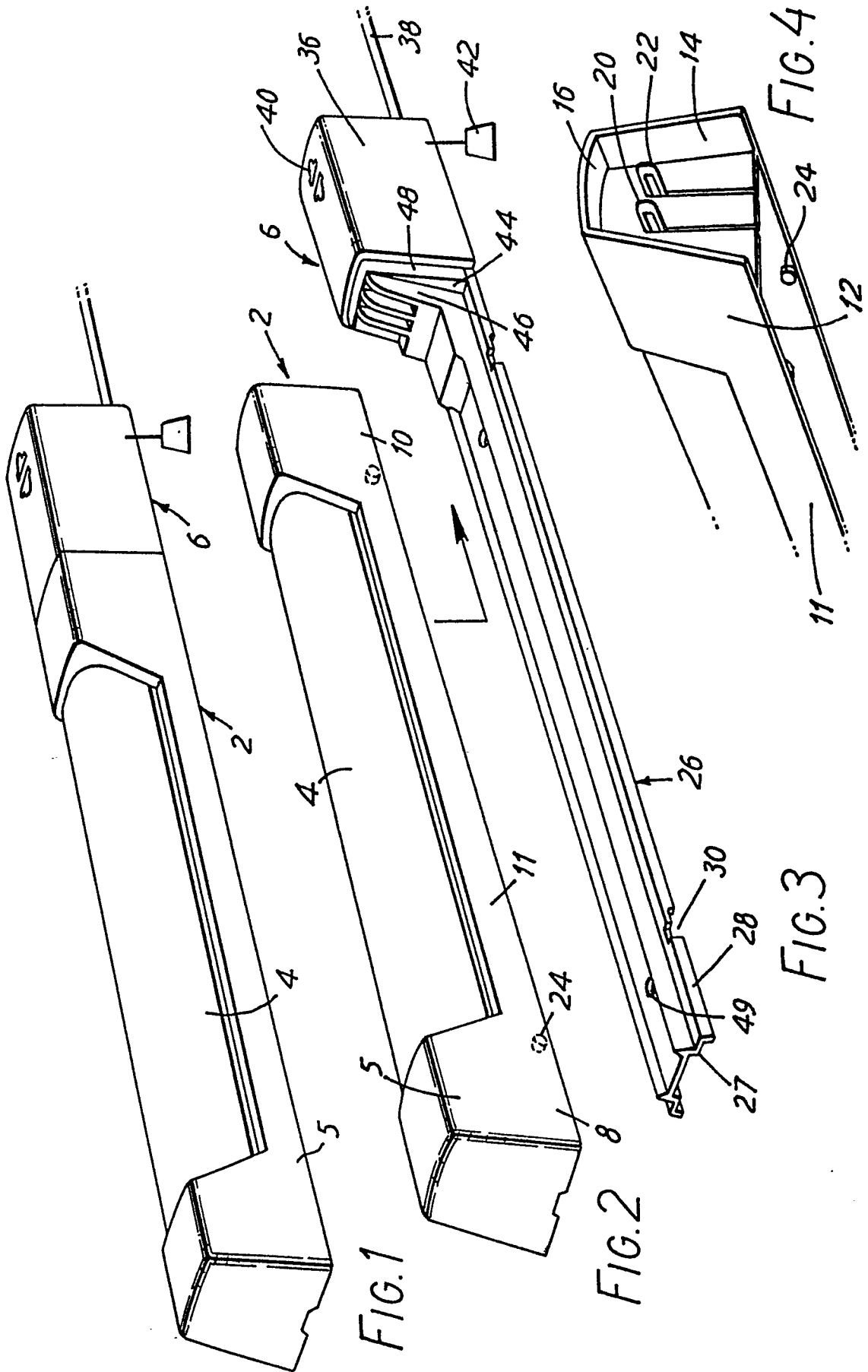
2. A lighting unit according to claim 1 wherein the co-operating means constrains the cartridge to move lengthwise between a retracted position in which the
20 cartridge can be disengaged from the holder by movement transverse to its length and an installed position in which the terminals are connected with the contacts and from which the cartridge can only be moved towards its retracted position.

25
3. A unit according to claim 2 wherein the co-operating means comprises a projection carried by the cartridge holder or the lighting element holder, slidable within a slot formed on the other part, the
30 slot having an introduction opening at one end, to receive the projection.

4. A unit according to claim 3 wherein the opening has a lead-in surface to guide the projection into the slot.
- 5 5. A unit according to claim 3 or 4 wherein the cartridge holder has a first pair of slots transversely spaced from one another, adjacent the contact end of the cartridge holder, and a second pair of slots, transversely spaced from one another, adjacent the
10 other end of the cartridge holder, the lighting element holder having four projections for respective engagement in the slots.
6. A unit according to claim 5, wherein one pair of
15 slots has a pair of upwardly directed guiding shoulders associated with the openings of the slots and the other pair of slots has no upstanding projections associated with its openings.
- 20 7. A unit according to any preceding claim wherein a pair of guiding surfaces is provided about each socket opening to guide the cartridge terminals into the socket openings when the cartridge is slid from its retracted to its installed position.
- 25 8. A lighting unit according to any preceding claim wherein the co-operating means is adapted to support the weight of the cartridge so that the terminals of the cartridge carry substantially none of the weight
30 thereof in the installed position.
9. A lighting unit according to any preceding claim wherein the terminals project from the same end of the cartridge.

10. A unit according to any preceding claim in which the cartridge holder has an elongate base member for securement to a wall and the lighting element holder has portions for engagement along the transverse edges of the base member.

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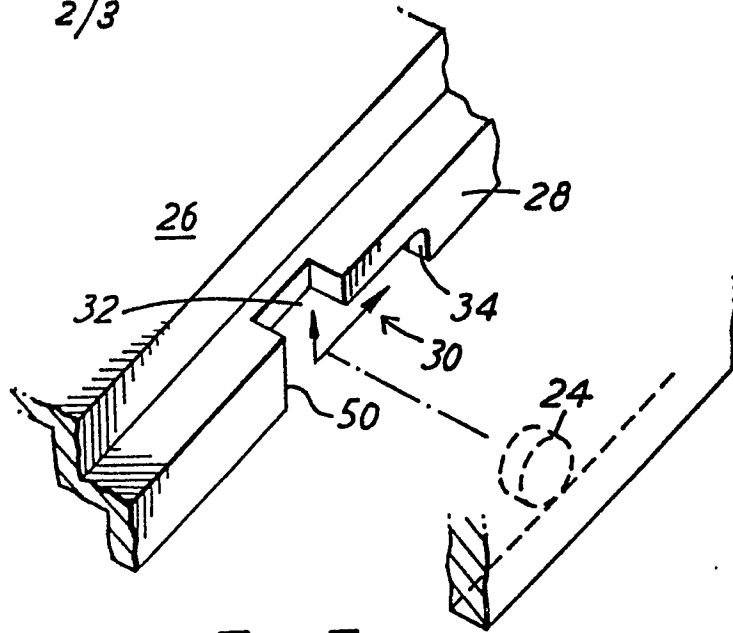


FIG. 5

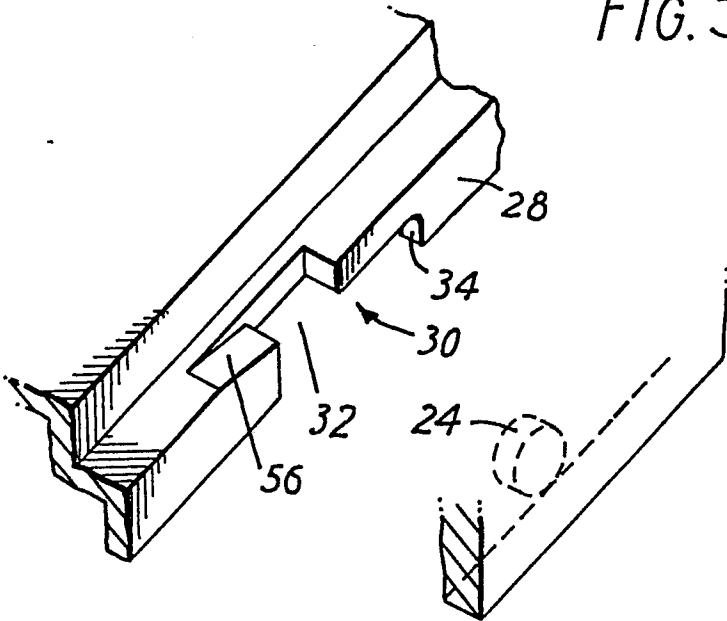


FIG. 7

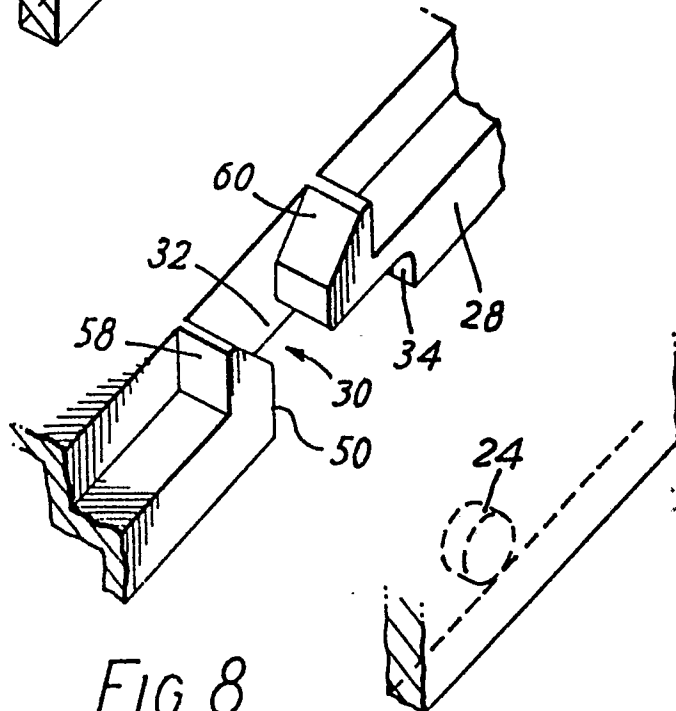


FIG. 8

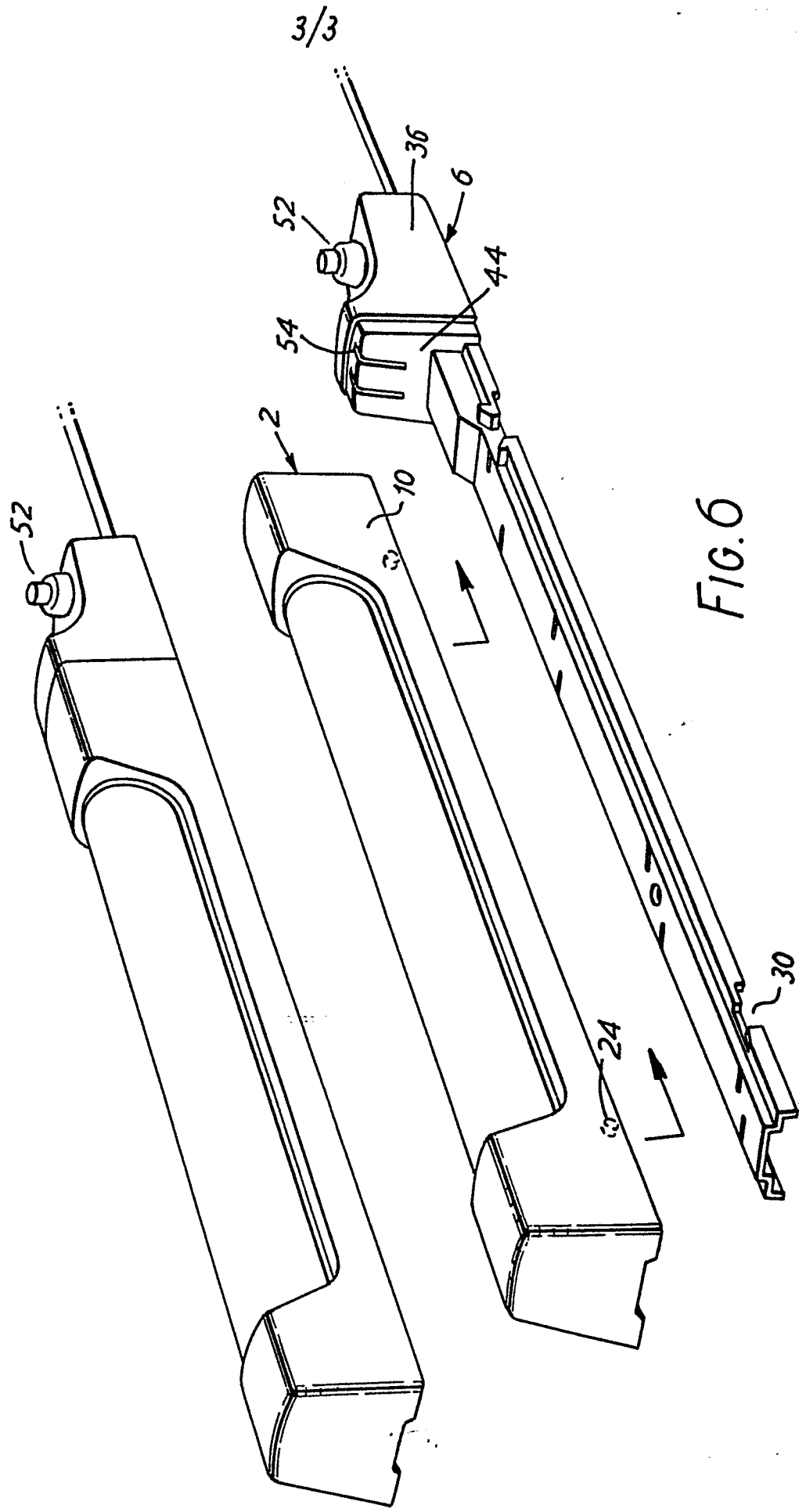


FIG. 6



| 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 | DE-C- 827 529 (KANDEM APPARATE) * Figures 1-3 * | 1,8-10 | F 21 S 3/02 F 21 V 23/06 |
| X | DE-C-1 000 526 (SCHNEIDER) * Figures 1-4 * | 1,8,9 | |
| A | GB-A-1 526 447 (F. & T. BUILDING) * Figures 1,2 * | 2,8 | |
| A | US-A-3 772 527 (DARLING) * Figures 1-4 * | 3-6,10 | |
| A | US-A-3 840 735 (KINGSLEY CHAN) * Figure 6 * | 3-6 | |
| A | US-A-2 978 575 (COHEN) * Figure 2 * | 3-6 | TECHNICAL FIELDS SEARCHED (Int. Cl.4) F 21 S F 21 V |
| A | US-A-1 629 568 (BENJAMIN) * Page 1, lines 93-101; figure 4 * | 7 | |
| The present search report has been drawn up for all claims | | | |
| Place of search THE HAGUE | | Date of completion of the search 19-06-1985 | Examiner FOUCRAY R.B.F. |
| CATEGORY OF CITED DOCUMENTS | | T : theory or principle underlying the invention E : 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 | |
| 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 | | | |