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64 Coating applicator head.

57 A coating applicator head comprises a body 10 having an extrusion slot 14 and an arcuate surface 12 over which the advancing strip 20 to be coated slides in passing to the extrusion slot. This ensures that the strip arrives at the extrusion slot in a flat condition across the width of the strip.

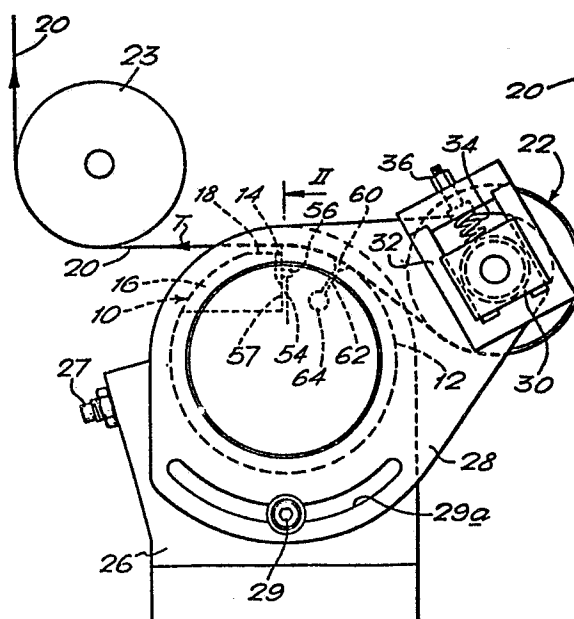


FIG.1.

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COATING APPLICATOR HEAD

This invention relates to a head for applying a coating of material to an advancing strip or band, for example adhesive to paper or plastics.

In a known form of coating applicator head, the strip or band to be coated advances longitudinally of itself and continuously along a generally straight-line path in wiping contact with the applicator head. The latter is formed with a slot oriented transverse to the strip or band to be coated, through which slot the coating material (e.g. adhesive) is extruded onto the strip or band. There is a tendency, with this form of applicator head, for the strip or band to deform into a series of longitudinal furrows or creases at and just downstream of the extrusion slot, in consequence of the tension applied to the strip in drawing it along its path and across the extrusion slot, at which slot it undergoes a slight change of direction because of relative pressure of the head towards the strip. Thus the strip fails to retain a flat or rectilinear profile along the length of the extrusion slot and consequently the applied coating is not uniform across the width of the strip, even to the extent of the strip having lines which are not coated at all.

In accordance with this invention, there is

provided a coating applicator head, comprising a body having an outer surface which is arcuate over at least a portion of its circumference, said arcuate surface portion being arranged for a strip or band to be
5 coated to pass continuously over it in wiping contact when drawn longitudinally under tension, said body being formed with an extrusion slot disposed at a downstream end of said arcuate surface portion and transverse to the direction of movement of the strip
10 or band.

In this applicator head, the strip or band remains in contact with the arcuate surface over a substantial arc and the strip or band arrives at the extrusion slot in a perfectly flat or rectilinear
15 condition along the length of the slot. It is thus ensured that the applied coating will be uniform across the width of the strip or band and indeed very light or thin coatings can be applied.

The applicator head may be used for applying
20 adhesive or other coating material. The adhesive may be a hot melt adhesive or a water-or solvent-based cold adhesive. Preferably the arcuate surface of the head is relieved immediately downstream of the extrusion slot, such that the strip does not contact
25 the head on the downstream side of the extrusion slot. This arrangement then avoids a cause of disuniformity in the applied coating which can arise when using water-or solvent-based adhesives, which is that a wiping contact of the strip with the head at the down-
30 stream side of the extrusion slot tends to cause a small quantity of the adhesive to solidify and collect (a phenomenon known in the art as "cheesing"): this can lead to uncoated lines appearing on the strip unless the head is periodically wiped clean (which
35 would require periodic interruption of the coating

process). Preferably further, the downstream side of the extrusion slot is defined by a member of known oil-impregnated plastics, which has the property of inhibiting adhesive from solidifying out of its solvent when the coated strip passes in rubbing contact with such plastics.

The applicator head may be used to apply coatings of material other than adhesive and because it will apply very light or thin coatings to a uniform thickness, it may be used for coating inks or varnishes or silicones.

The applicator head preferably includes a roller on which the strip or band runs in passing to the applicator body, the roller being adjustable in position relative to the applicator body so as to adjust the angular position at which the strip or band comes into contact with the arcuate surface. Preferably this roller is resiliently mounted so as to be able to take up any temporary increases in tension in the strip or band being coated.

Disuniformity can sometimes arise in the applied coating due to any small particles which may have become entrained on the strip surface to be coated. In particular, these particles may collect at the upstream side of the extrusion slot and lead to corresponding uncoated lines along the strip. For these cases, the arcuate surface portion of the applicator head may be formed with a groove to which suction or air pressure may be applied, for sucking or blowing away any particles on the strip surface which is to be coated.

An embodiment of this invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is an end view of a coating

applicator head embodying this invention;

Figure 2 is a longitudinal section through the applicator head at one end thereof, on the line II - II of Figure 1, but showing the coating body turned 180° on its axis and with a member which defines the downstream side of the extrusion slot removed; and

Figure 3 is a similar section through the applicator head at its other end.

Referring to the drawings, the applicator head has a generally cylindrical coating body 10 mounted with its axis horizontal. The body thus presents a cylindrical or arcuate outer surface 12 which is formed with an extrusion slot 14 running substantially the full length of the body. The downstream side of the slot 14 is defined by a segment or member 16 (shown removed in Figures 2 and 3) which is relieved at 18 as shown. This member may be formed of an oil-impregnated plastics, if the applicator head is to be used to apply coatings of water-based or solvent-based adhesives. A strip of paper or plastics to be coated is shown at 20 in Figure 1 and is drawn past the extrusion slot, continuously and lengthwise of itself, under tension which is applied to it and represented in Figure 1 by an arrow T. In the example shown, the strip passes downwardly and is guided first on a roller 22 then passes onto the body 10, to slide around its arcuate surface 12 to the top of the latter, where in operation the extrusion slot 14 is positioned. The strip then passes horizontally across the extrusion slot, losing contact with the applicator head at the upstream side of the extrusion slot (taking a path tangential to the arcuate surface 12 at this point), and passes horizontally to a second guide roller 23. The strip passes upwardly from this roller to further

apparatus (e.g. a winding up roller).

It will be seen that the strip 20 passes out of contact with the head at the downstream side of the extrusion slot. The body 10 has reduced-diameter end portions received within circular apertures in mounting plates 26, and the body can be rotated in these about its axis (and locked in position by a locking bolt 27 in each mounting plate), so as to adjust the size of the gap between the strip 20 and the underlying relieved surface 18 to provide optimum coating conditions. The amount of adjustment is a matter of a few degrees.

The roller 22 is mounted for adjustment of its position so as to adjust the angular position at which the strip comes into contact with the arcuate surface 12, consequently adjusting the arc of the surface 12 over which the strip 20 slides and correspondingly the change in longitudinal tension in the strip which takes place in sliding around the body 10. Thus, the roller 22 is journaled at its opposite ends to respective brackets 28, which are provided with circular apertures and disposed against the respective mounting plates 26 so as to receive the reduced-diameter ends of the body 10. The brackets can therefore be turned around the axis of body 10, and locked in position by respective locking bolts 29 (only one shown) which pass through arcuate slots in the respective brackets and are threaded into the respective mounting plates.

Preferably the roller 22 is resiliently mounted to the brackets 28 so that it can take up or respond to any temporary increases in tension in the strip 20, including any differentials in tension across the width of the strip (i.e. along the length of the roller). Thus, the ends of the roller 22 are

journalled in respective blocks 30 (see Figure 1) which are slidable within a cage 32 against the bias of a spring 34, the effect of which is adjustable by a screw 36. The cage 32 is mounted to the bracket 5 28 and is preferably pivotable relative to the bracket 28 to suit the arc over which the strip 20 is in contact with the roller 22.

Referring particularly to Figures 2 and 3, the coating body 10 is formed with two longitudinal 10 bores 40, 42, one on the axis and one offset from the axis. Bore 42 accommodates a cylindrical filter 44 and material to be coated is pumped through a feed line 46 into the filter at an end of body 10 (see Figure 3). The coating material passes radially 15 through the filter into the space surrounding it, then passes from bore 42 to bore 40, via a connecting passage 48 at the other end of the body 10 (see Figure 2). Bore 40 accommodates a tube 50 into which the coating material passes via a shut-off 20 valve 52. Tube 50 is formed with an aperture through its wall at its mid-point, allowing the coating material to pass to the space of bore 40 which surrounds the tube 50. The material then flows through radial channels 54 to a longitudinal gallery 56: 25 channels 54 and gallery 56 are formed as grooves in a radial face 57 of the body 10, against which the member or segment 16 is bolted. The co-operating face of this member 16 is relieved for almost its full length, to define the extrusion slot 14, with which 30 the gallery 56 communicates.

As indicated in Figure 1, the arcuate surface 12 may be formed, at a point upstream of the extrusion slot, with a groove 60 which is generally parallel to the extrusion slot. Passages 62 extend radially 35 inwards from this groove, at intervals along its length,

to a parallel gallery 64 to which suction or air under pressure may be applied, for sucking or blowing away particles which may be entrained on the surface of the strip 20.

5 The applicator head ensures that the strip 20 arrives at the extrusion slot in a flat condition across its width. Accordingly the applicator head provides a coating which is uniform across its width and along its length and may indeed be very thin if
10 required. The applicator head may be of any size, according to the width of strip to be coated: a typical strip width might be 24 inches, but the principles of the applicator head apply for strips of much greater or lesser width.

15 It is envisaged that the extrusion slot may be discontinuous along its length if it is required to leave predetermined stripes on the strip uncoated: the intervening predetermined coated stripes will
20 then be coated uniformly across their width and along their lengths.

CLAIMS

1. A coating applicator head, comprising a body formed with an elongate extrusion slot over which a strip or band to be coated passes continuously when drawn longitudinally under tension, characterised in that the body (10) has
5 an outer surface which is arcuate over at least a portion (12) of its circumference and arranged for the strip or band (20) to be coated to slide over that arcuate surface in wiping contact, the extrusion slot being disposed at a downstream end of said arcuate surface position.
- 10 2. A coating applicator head as claimed in Claim 1, characterised in that the surface of said body (10) is relieved (at 18) immediately downstream of the extrusion slot (14) such that the strip or band does not contact the head on the downstream side of the extrusion slot.
- 15 3. A coating applicator head as claimed in Claim 1 or 2, characterised by mounting means (26, 27) for said body about its axis.
- 20 4. A coating applicator head as claimed in any one of Claims 1 to 3, characterised by a roller (27) on which the strip or band (20) runs in passing to the applicator body (10), the roller being adjustable in position relative to the applicator body so as to adjust the angular position at which the strip or band comes into contact with the arcuate surface of the applicator body.
- 25 5. A coating applicator head as claimed in Claim 4, characterised in that said roller (22) is journalled in brackets (28, 28) which are rotationally adjustable around the axis of the applicator body.
- 30 6. A coating applicator head as claimed in Claim 4 or 5, characterised in that said roller (22) is resiliently mounted so as to be able to take up any temporary increases in tension in the strip or band.

7. A coating applicator head as claimed in any preceding claim, characterised in that the applicator body is provided with a groove (60) in its said arcuate surface, to which suction or air pressure may be applied for sucking or blowing away particles which may be entrained on the surface of the incoming strip or band to be coated.

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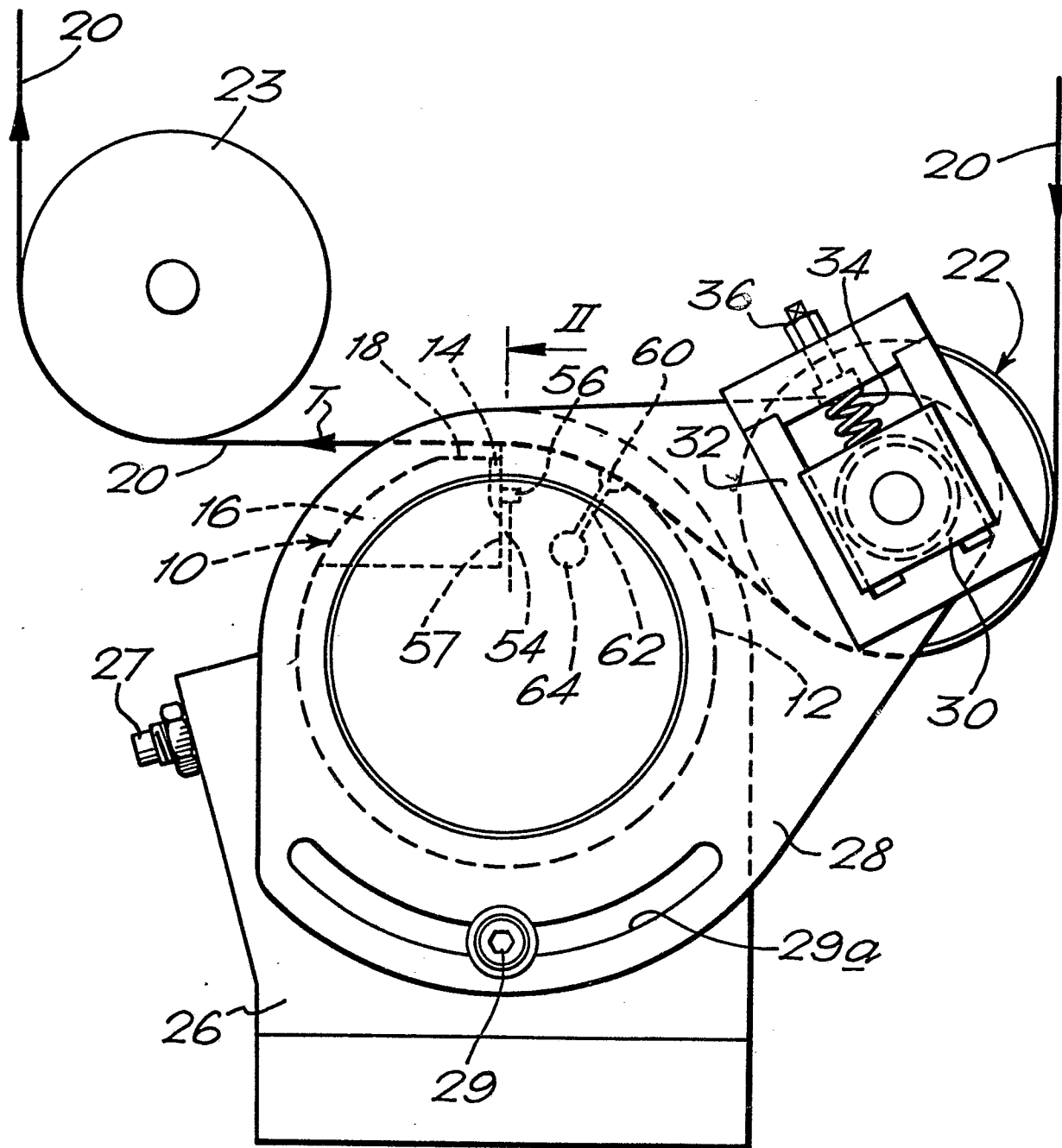


FIG. 1.

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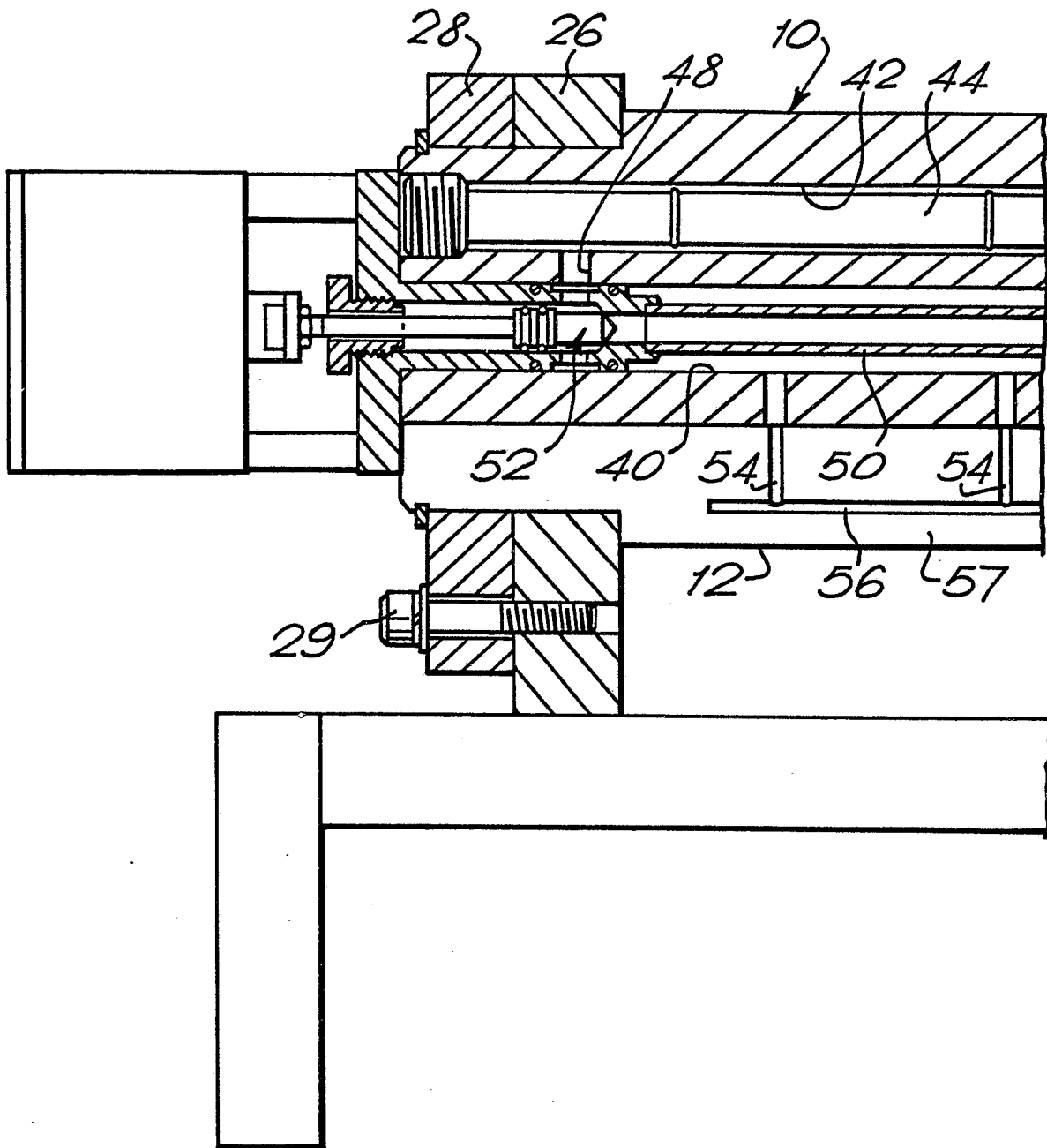


FIG. 2.

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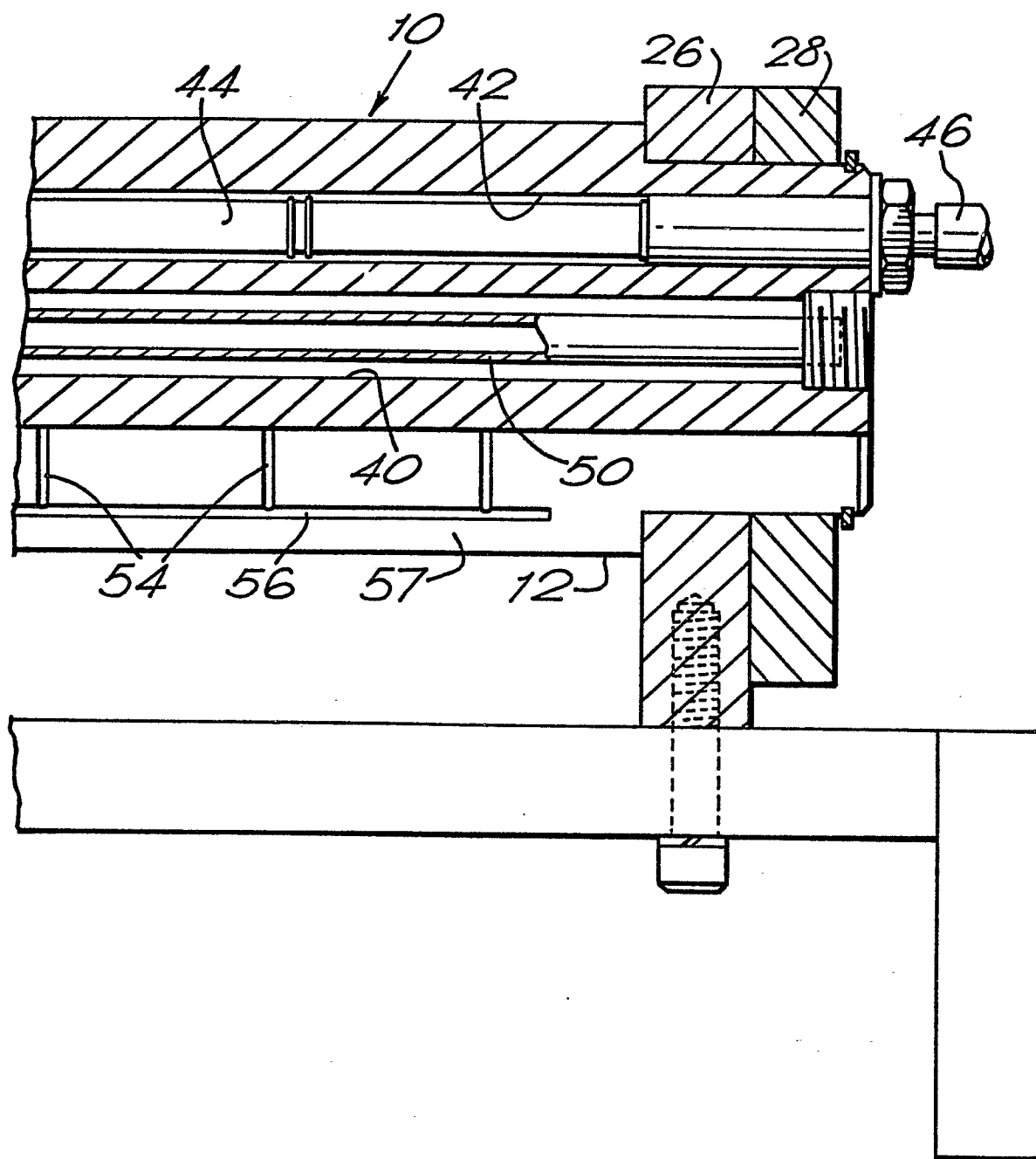


FIG. 3.



European Patent
Office

EUROPEAN SEARCH REPORT

0163451

Application number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 85303379.3
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	DE - A - 2 305 889 (BISCHOF UND KLEIN) * Claims; fig. *	1	B 05 C 1/04 B 05 C 5/02
A	US - A - 3 408 984 (PULLINS) * Totality *	1	
A	DE - A1 - 2 606 328 (INVENTING S.A.) * Claims; fig. *	1	
A	US - A - 2 784 697 (UHLEEN) * Totality *	1	
A	US - A - 3 496 012 (BIORSETH) * Totality *		TECHNICAL FIELDS SEARCHED (Int. Cl.4)
A	DE - A - 1 546 383 (HISAYOSHI) * Claims; fig. *		B 05 C B 41 F B 05 D
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 14-08-1985	Examiner SCHÜTZ
CATEGORY OF CITED DOCUMENTS			
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		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	