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(54) Improvements relating to rotary driers

(57) A rotary drier with a sleeve, generally shown as (1) in Figure 1, for supporting arms of the drier so that they may be raised and lowered by sliding the sleeve (1) up and down a support column for the drier. The sleeve (1) includes a latch mechanism (11), which is captive within but separable from the sleeve. The latch mechanism (11) is co-operable with a flat, which extends over a length of the support column so that rotation of the sleeve about the column may be prevented. The latch mechanism (11) has a release part (20), which may be accessed through an aperture (5) in the sleeve (1) so that the sleeve can be released from the column and moved as desired.

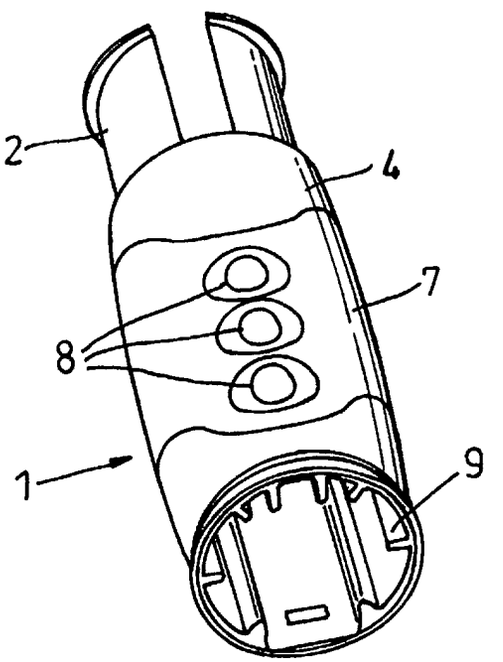

Fig. 1

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Description

[0001] This invention relates to rotary driers and in particular to a sleeve for use with rotary driers.

[0002] Rotary driers are known which have a support column and a slidable member, on to which arms are pivotally attached. The slidable member can be moved up and down the support column between a lowered position with the arms upright alongside the column and a raised position with the arms radiating outwardly and upwardly, bringing taut a "spiders web" of lines between the arms. The arms are coupled by stays to the head of the column and there is provision for locking the slidable member in the raised position. Often there are alternative locking positions, to make the lines more or less taut, and sometimes the stays are coupled to a fitting which, while usually at the head of the column, can be set at lower positions, the slidable member then also being set at correspondingly lower positions when fully raised.

[0003] The locking of the sleeve is usually achieved by a latch on the slidable member engaging one of a series of detents on the column. Conveniently, the column would be of circular cross section throughout, with the slidable member correspondingly shaped, but at least at the detents this cannot be entirely so. It is in any event desirable to have the sleeve non-rotatable on the column throughout its travel so that the stays are not called upon to resist twisting about the column and so that the latch registers reliably with the detents.

[0004] One known construction, therefore, has the column formed with a flat along its length, and to this flat there is secured, at least one element providing the detents. The slidable member is formed with a complementary internal shape to be non-rotatable about the column.

[0005] In fact forming one flat on a tube to provide the column is more difficult than forming two diametrically opposed flats. So that is the usual shape, and the slidable member can co-operate with the second flat and so be prevented from rotating.

[0006] However, this is not an elegant construction. Not only does the element with the detents stick out, but the latch mechanism generally requires or results in an unsightly projection on the exterior of the slidable member.

[0007] The present invention seeks to provide a more streamlined and easier to operate way of raising and lowering the arms of a rotary dryer.

[0008] According to a first aspect of the invention, there is provided the present invention there is provided a rotary drier including a support column having at least one flat extending over a length of said support column, a sleeve for pivotally supporting arms of the drier, said sleeve being slidable up and down the support column over a length spanned by the at least one flat, and a latch mechanism separable from but captive within the sleeve, said latch mechanism being co-operable with the flat to substantially prevent rotation of the sleeve, the latch mechanism having a latch member with a release part accessible through the sleeve and a latch part having a projection which can be urged into at least one of a plurality of apertures in the flat, when said aperture and the projection are in registry.

[0009] Preferably the support column is tubular.

[0010] It is envisaged that the latch mechanism includes an elongate frame that supports the latch member, said latch member being pivotal about a transverse axis of said elongate frame.

[0011] Preferably the latch member includes an elongate body having first and second end regions each with a projection extending in opposed transverse directions from respective first and second end regions to form the release part and the latch part respectively, said elongate body also including a pivot point at which said elongate frame can be pivotally attached to the frame of the latch mechanism.

[0012] In a preferred arrangement the sleeve includes at least two apertures a first and second of which being situated towards respective ends of the sleeve.

[0013] Ideally a first of the apertures is arranged to receive the release part of the latch member which is extendible into and is accessible by said aperture in the sleeve.

[0014] The second of the apertures preferably is for receiving a detent on the elongate frame so that latch mechanism and sleeve can be held together.

[0015] In a preferred arrangement the projection of the latch part is urged towards at least one of the apertures in the support column by a resilient member between the elongate frame of the latch mechanism and the end of the elongate member supporting the release part.

[0016] It is preferred that the resilient member is a spring, one end of which is seated on a stud in the elongate frame with the other end of the spring abutting against the underside of the release part.

[0017] Preferably the sleeve includes a resilient moulding extending substantially along the length of the latch mechanism between the first and second apertures at either end of the sleeve.

[0018] It is envisaged that the moulding includes ridges to provide a finger grip region on the sleeve.

[0019] The exterior of the sleeve can therefore be smoothly contoured to provide a comfortable grip. Preferably it will be of moulded plastics material sheathed in the material known as Santoprene ®.

[0020] Generally, as mentioned above, there will be a set of apertures to give alternative settings of the sleeve.

[0021] In the preferred form the latch mechanism comprises an elongate frame with the actual latch pivoted within it about a transverse axis. At one end the latch has a button (the release part) which will project into an aperture in the sleeve when the frame is properly located within, lying longitudinally of the sleeve. A spring between the underside of the button and the frame urg-

es the other end of the latch radially inwards, and this other end has the projection to engage in the aperture (s) in the column. It will snap into place, while release is effected by pressing the button.

[0022] According to a second aspect of the invention there is provided a sleeve for a rotary drier, said sleeve being arranged to be slidable up and down a support column for the rotary drier having at least one flat extending over a length of said support column, the sleeve having a first part for pivotally supporting arms of the drier, and a second part providing a grip region to enable the sleeve to be moved relative to the column, said sleeve also including a latch mechanism separable from but captive within the sleeve, said latch mechanism being co-operable with the flat to substantially prevent rotation of the sleeve, the latch mechanism having a latch member with a release part accessible through the sleeve and a latch part having a projection which can be urged into at least one of a plurality of apertures in the flat, when said aperture and the projection are in registry.

[0023] In a preferred embodiment the sleeve is tubular.

[0024] Preferably the latch mechanism includes an elongate frame that supports the latch member, said latch member being pivotal about a transverse axis of said elongate frame.

[0025] It is envisaged that the latch member includes an elongate body having first and second end regions each with a projection extending in opposed transverse directions from respective first and second end regions to form the release part and the latch part respectively, said elongate body also including a pivot point at which said elongate frame can be pivotally attached to the frame of the latch mechanism.

[0026] In a preferred arrangement, the sleeve includes at least two apertures a first and second of which being situated towards respective ends of the sleeve.

[0027] It is envisaged that a first of the apertures is arranged to receive the release part of the latch member which is extendible into and is accessible by said aperture in the sleeve.

[0028] Ideally a second of said apertures is arranged to receive a detent on the elongate frame so that latch mechanism and sleeve can be held together.

[0029] Preferably the second of said projections is urged towards the aperture in the column by a resilient member between the elongate frame of the latch mechanism and the end of the elongate member supporting the release part.

[0030] Ideally the resilient member is a spring, one end of which being seated on a stud on the elongate frame, with the other end of the spring abutting against the underside of the release part.

[0031] It is preferred that a resilient moulding extends substantially along the length of the latch mechanism between the first and second apertures at either end of the sleeve.

[0032] Preferably the moulding includes ridges to provide a finger grip region for the sleeve.

[0033] For a better understanding of the invention, one embodiment will now be described, by way of example, with reference to the accompanying drawings, in which:

Figures 1 to 3 are perspective views of an arm supporting sleeve for a rotary drier,
Figures 4 and 5 are side views of the sleeve, the views being at right angles,
Figures 6 and 7 are longitudinal sections of the sleeve on the lines VI-VI and VII-VII respectively of Figures 5 and 4,
Figures 8 and 9 are top and bottom end views of the sleeve,
Figure 10 is a section on the line X-X of Figure 4,
Figure 11 is a perspective view of a frame for a latch mechanism that fits within the sleeve,
Figure 12 is a face view of the frame,
Figure 13 is a side view of the frame,
Figure 14 is a top end view of the frame,
Figure 15 is a front face view of a latch that pivots within the frame,
Figure 16 is a rear face view of the latch,
Figure 17 is a side view of the latch, and
Figure 18 is a section on the line XVIII-XVIII of Figure 15.

[0034] The sleeve 1 is plastics moulding of generally tubular form. At its upper end 2 it is reduced and bifurcated to receive a collar (not shown) to which the arms of the rotary drier are pivoted. But below shoulder 3 on which the collar will bear it swells outwardly and then reduces slightly over main portion 4. Towards the upper end of this portion there is a circular aperture 5, and near the lower end, centred on the same radial plane, there is a rectangular aperture 6. Around the middle of the portion 4 there is a sheath 7 of softer, more grippable material, such as Santoprene, which is clear of the apertures 5 and 6 but which covers and depresses into dimples 8 on the opposite side, these providing finger locations for an even better grip. Internally, the sleeve 1 has longitudinal fins 9 whose edges co-operate with the column of the drier, and between two of these fins, symmetrically on either side of the apertures 5 and 6, a latch mechanism is located. Also internally of the sleeve 1, at the shoulder 3, there are downwardly projecting lugs 10 which additionally contribute to the location of the latch mechanism, as described below.

[0035] The latch mechanism 11 has an elongate rectangular frame 12. Across its upper end, projecting from its outer face, there is a ledge 13, and shortly below this there is central stud 14 on a sunk transverse web 15. Further below again, the sides of the frame 12 are pierced at 16 to accept a pivot pin, and towards the lower end a sunk skeletal web 17 spans the frame. On the outer face of its lower cross portion the frame 12 has a

rectangular stud 18.

[0036] A latch 19 fits within this frame above the web 17. It is slightly cranked and pivots about the pin through the apertures 16. Its upper end has a button 20 that projects outwardly, extending freely into the aperture 5. The button 20 is hollow on the inside and receives a short helical spring 21 whose inner end locates over the stud 14. This upper end is therefore urged outwardly, and the lower end inwardly. On the inside of this lower end there is a tooth 22, which is the projection that will positively engage the column and hold the sleeve 1 at the desired height.

[0037] The frame 12 fits into the sleeve 1 between two fins 9. It is introduced at a slight angle through the lower end until the ledge 13 engages under the lugs 10. It is then swung out against the inside of the sleeve, the button 20 entering the aperture 5 and the stud 18 locating in the aperture 6. This assembly can then be slid onto a column with a longitudinal flat, or more likely one with two opposed flats as mentioned above. The latch mechanism is aligned with the flat which is pierced with a series of apertures at the intended set height of the sleeve and serves as a captive key to maintain the sleeve 1 against rotation. The tooth 22 is pressed against the flat by the spring 21.

[0038] Any one of the apertures in the flat can receive the tooth 22, which will normally snap into the lowermost one as the drier is expanded for use. But pressing the button 20 will release it and the sleeve 1 can be urged upwards and an alternative aperture found. Of course, when the arms are to be lowered the button 20 is pressed and kept there until the tooth is below the lowermost aperture.

[0039] It is possible to provide a similar latch arrangement on a head fitting to which the stays are pivoted and to have that fitting as a sleeve movable up and down the column. There would then be apertures over a much greater length of the flat, enabling the arms to be set with the lines taut over a considerable range of heights.

Claims

1. A rotary drier including a support column having at least one flat extending over a length of said support column, a sleeve for pivotally supporting arms of the drier, said sleeve being slidable up and down the support column over a length spanned by the at least one flat, and a latch mechanism separable from but captive within the sleeve, said latch mechanism being co-operable with the flat to substantially prevent rotation of the sleeve, the latch mechanism having a latch member with a release part accessible through the sleeve and a latch part having a projection which can be urged into at least one of a plurality of apertures in the flat, when said aperture and the projection are in registry.

2. A rotary drier according to Claim 2, wherein the support column is tubular.

3. A rotary drier according to Claim 1 or Claim 2, wherein the latch mechanism includes an elongate frame that supports the latch member, said latch member being pivotal about a transverse axis of said elongate frame.

4. A rotary drier according to Claim 3, wherein the latch member includes an elongate body having first and second end regions each with a projection extending in opposed transverse directions from respective first and second end regions to form the release part and the latch part respectively, said elongate body also including a pivot point at which said elongate frame can be pivotally attached to the frame of the latch mechanism.

5. A rotary drier according to any preceding claim, wherein the sleeve includes at least two apertures a first and second of which being situated towards respective ends of the sleeve.

6. A rotary drier according to Claim 5, wherein a first of the apertures is arranged to receive the release part of the latch member which is extendible into and is accessible by said aperture in the sleeve.

7. A rotary drier according to any preceding claim, wherein the second of the apertures is for receiving a detent on the elongate frame so that latch mechanism and sleeve can be held together.

8. A rotary drier according to any preceding claim, wherein the latch projection is urged towards at least one of the apertures in the support column by a resilient member between the elongate frame of the latch mechanism and the end of the elongate member supporting the release part.

9. A rotary drier according to any preceding claim, wherein the sleeve includes a resilient moulding extending substantially along the length of the latch mechanism between the first and second apertures at either end of the sleeve.

10. A rotary drier according to Claim 9, wherein the moulding includes ridges to provide a finger grip region on the sleeve.

11. A sleeve for a rotary drier, said sleeve being arranged to be slidable up and down a support column for the rotary drier having at least one flat extending over a length of said support column, the sleeve having a first part for pivotally supporting arms of the drier, and a second part providing a grip region to enable the sleeve to be moved relative to the col-

umn, said sleeve also including a latch mechanism separable from but captive within the sleeve, said latch mechanism being co-operable with the flat to substantially prevent rotation of the sleeve, the latch mechanism having a latch member with a release part accessible through the sleeve and a latch part having a projection which can be urged into at least one of a plurality of apertures in the flat, when said aperture and the projection are in registry.

12. A sleeve according to Claim 11, wherein the sleeve is tubular.

13. A sleeve according to Claim 11 or Claim 12, wherein the latch mechanism includes an elongate frame that supports the latch member, said latch member being pivotal about a transverse axis of said elongate frame.

14. A sleeve according to Claim 13, wherein the latch member includes an elongate body having first and second end regions each with a projection extending in opposed transverse directions from respective first and second end regions to form the release part and the latch part respectively, said elongate body also including a pivot point at which said elongate frame can be pivotally attached to the frame of the latch mechanism.

15. A sleeve according to any of Claims 12 to 14, including at least two apertures a first and second of which being situated towards respective ends of the sleeve.

16. A sleeve according to Claim 15, wherein a first of the apertures is arranged to receive the release part of the latch member which is extendible into and is accessible by said aperture in the sleeve.

17. A sleeve according to Claim 16, wherein a second of said apertures is arranged to receive a detent on the elongate frame so that latch mechanism and sleeve can be held together.

18. A sleeve according to Claim 17, wherein the second of said projections is urged towards the aperture in the column by a resilient member between the elongate frame of the latch mechanism and the end of the elongate member supporting the release part.

19. A sleeve according to Claim 18, wherein the resilient member is a spring, one end of which being seated on a stud on the elongate frame, with the other end of the spring abutting against the underside of the release part.

20. A sleeve according to any of Claims 12 to 19, including a resilient moulding extending substantially along the length of the latch mechanism between the first and second apertures at either end of the sleeve.

21. A sleeve according to Claim 20, wherein the moulding includes ridges to provide a finger grip region for the sleeve.

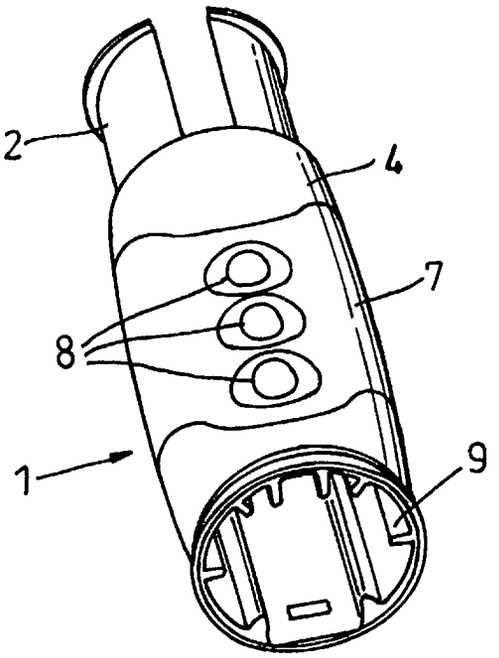

Fig. 1

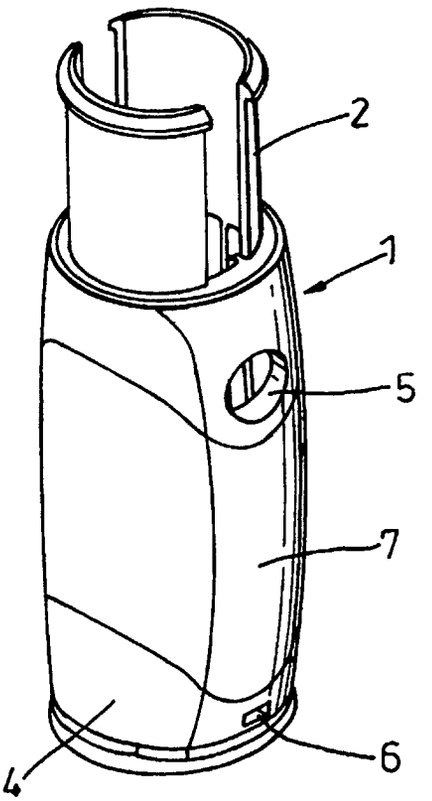

Fig. 2

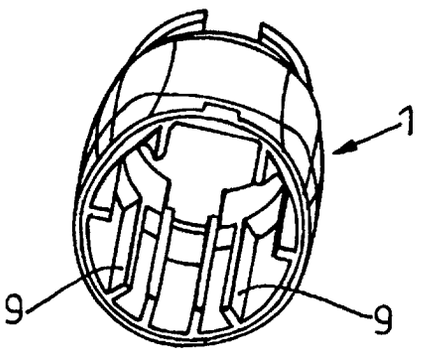

Fig. 3

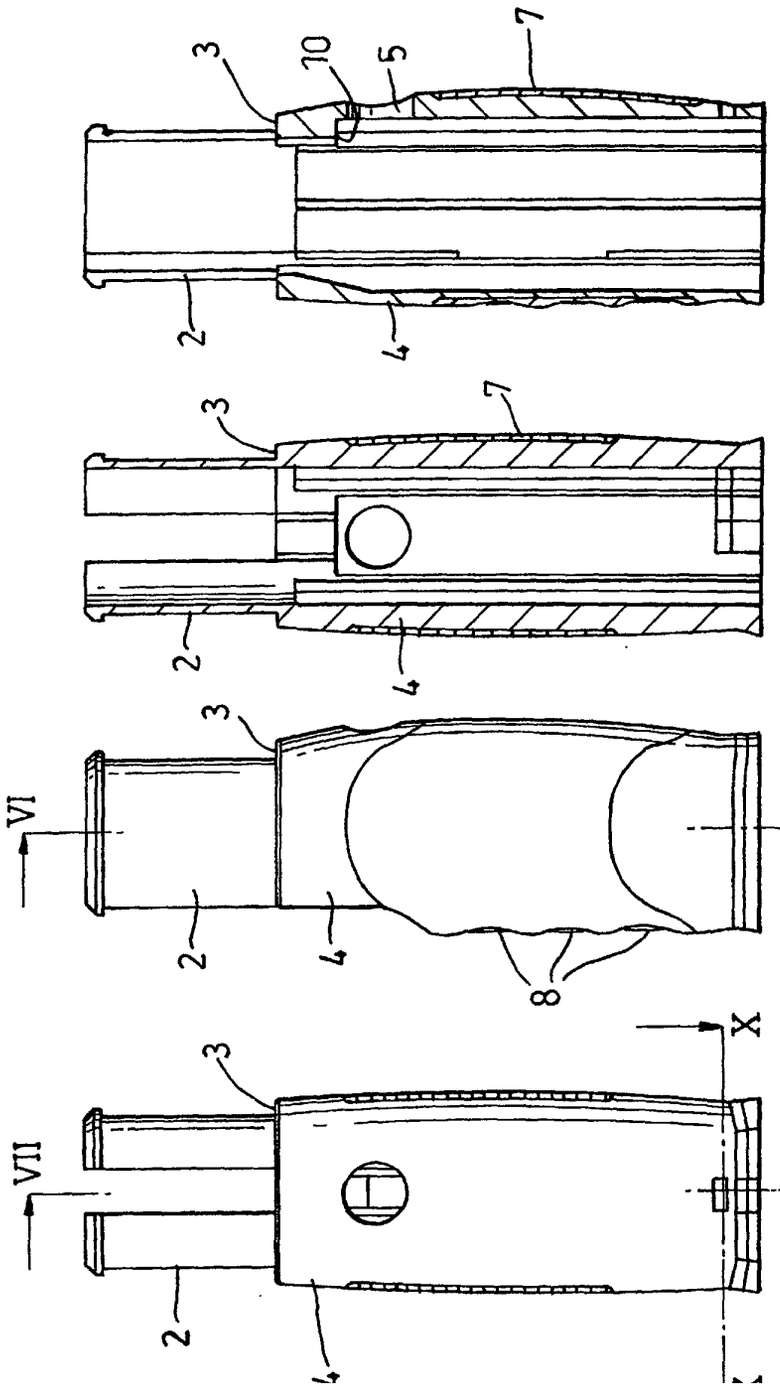

Fig. 7

Fig. 6

Fig. 5

Fig. 4

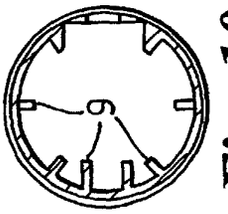

Fig. 10

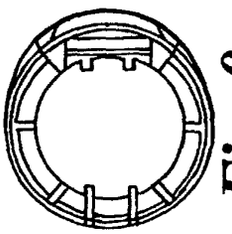

Fig. 9

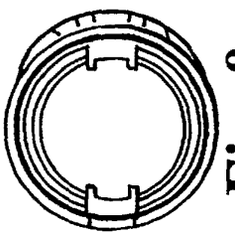

Fig. 8

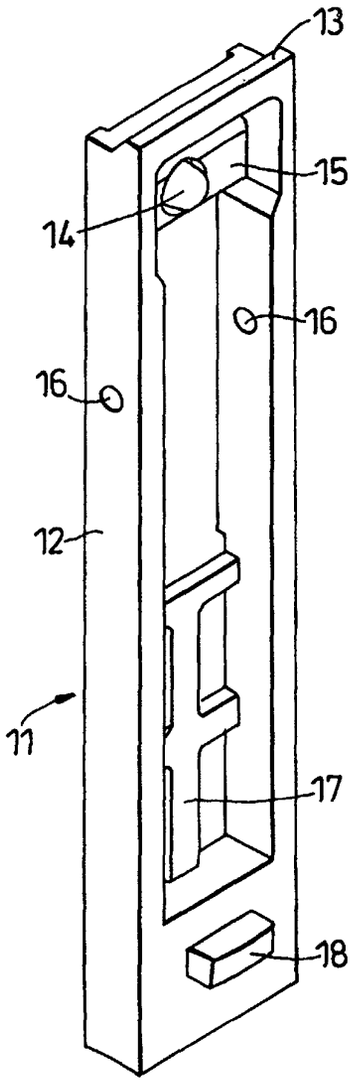

Fig. 11

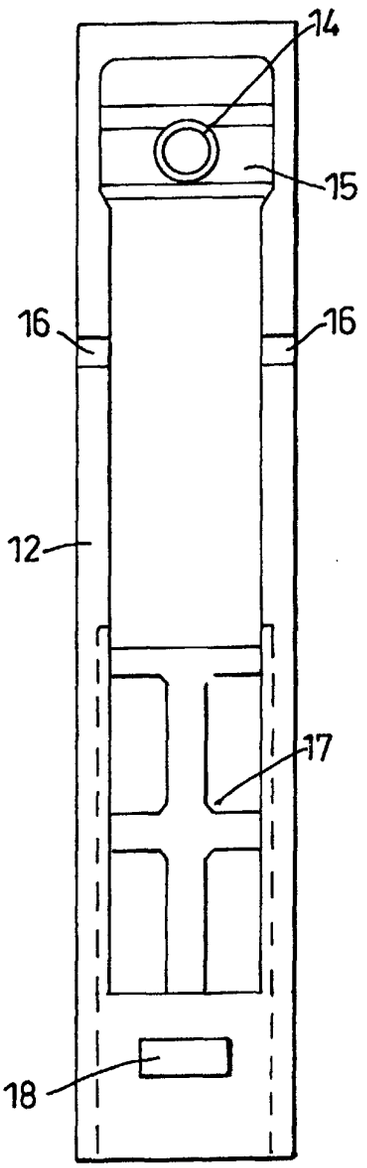

Fig. 12

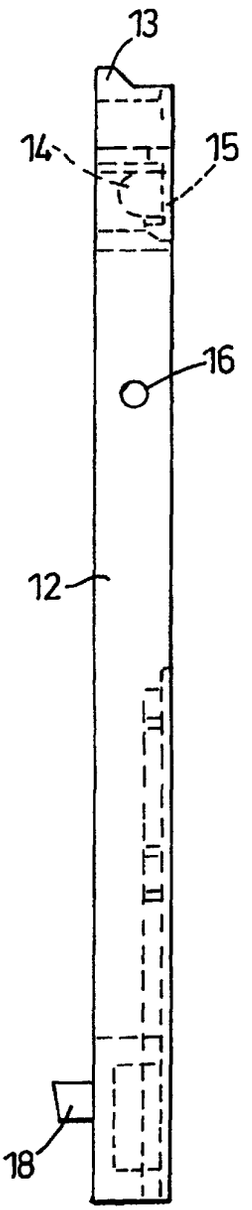

Fig. 13

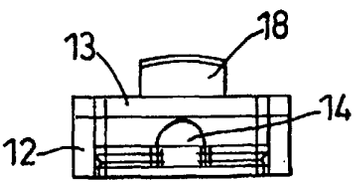

Fig. 14

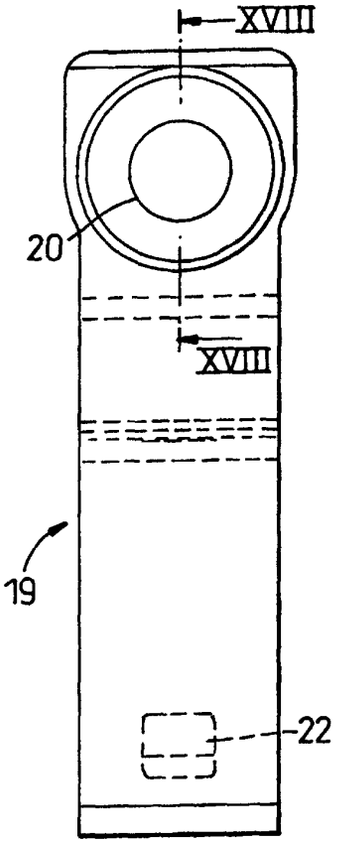

Fig. 15

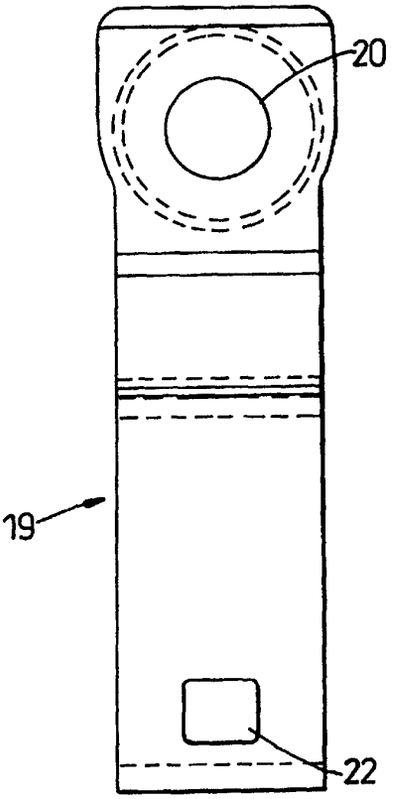

Fig. 16

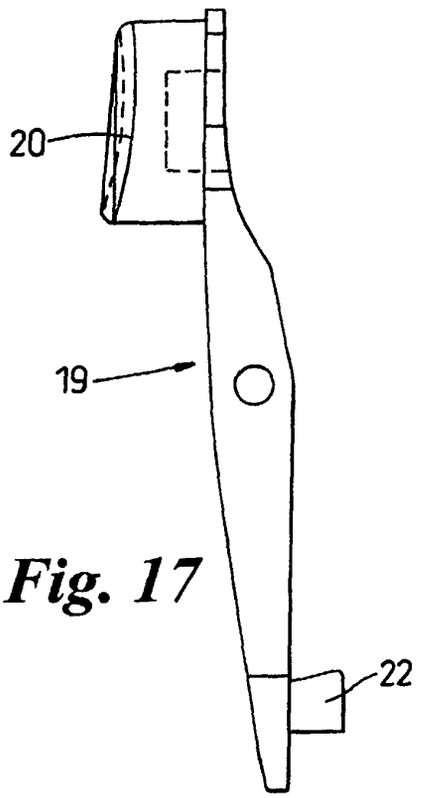

Fig. 17

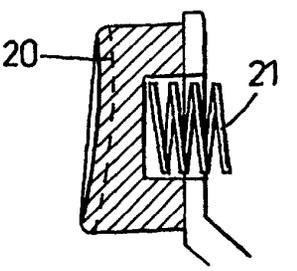

Fig. 18