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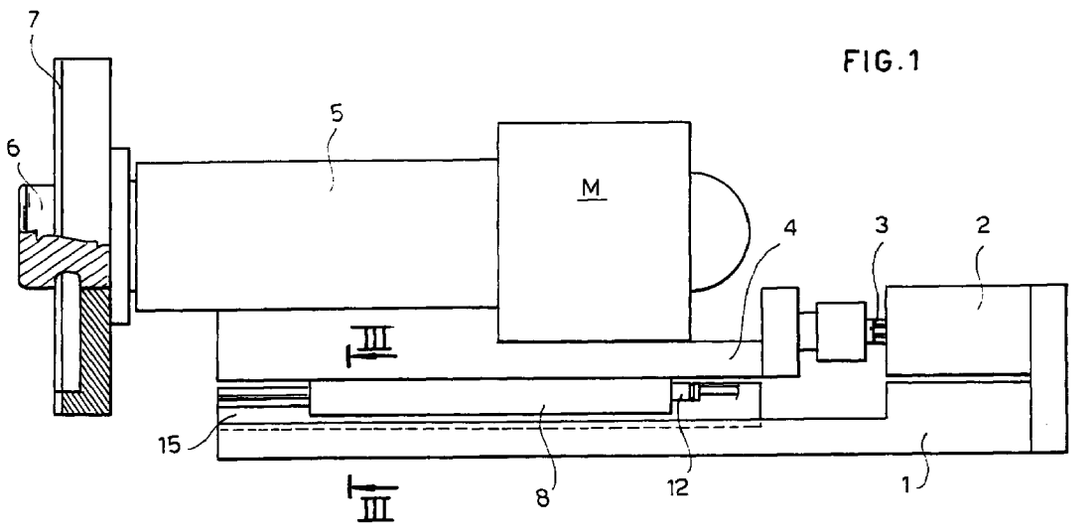
(54) Grinding wheel support assembly for sharpening circular or endless blades

(57) A grinding wheel support assembly for sharpening circular or endless blades comprising a support (4, 5) able to support a shaft (6) to the end of which is force-fitted a grinding wheel (7) which is set in rotation by a motor (M) and a pneumatic cylinder (2) to cause sliding of the support (4) on a system of guides, in which a jet of compressed air, dry or lubricated according to requirements, injected into said system of guides, reduces the sliding friction and keeps the system clean.

FIG.1



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Description

[0001] The present invention relates to a grinding wheel support assembly for sharpening circular or endless blades, particular suitable for cutting-off machines intended for cuffing logs of sheet material, such as paper, tissue paper, non-woven fabric, plastics, etc.

[0002] In the manufacture of rolls of sheet material, logs are initially produced and must subsequently be cut into rolls of the desired length. This is done by special cuffing-off machines which have one or more disc or rotating band blades, which are cyclically lowered onto the logs that are to be cut, which are fed in special channels. The cutting cycles are very frequent, therefore after a very short time the cutting blade becomes worn through the effect of friction, causing uneven cutting which affects the aesthetic quality of the product. It is therefore necessary for the cutting blades to be kept sharpened by means of sharpening discs or grinding wheels which are constantly or periodically brought into contact with the profile of the cutting blade. Normally, two grinding wheels are mounted for each cutting blade, in staggered positions along the circumference of the blade, one facing one surface of the cutting blade and the other facing the opposite surface. Said grinding wheels are set in rotation, for example, by means of electric motors, air turbines and the like and they are caused to move forward toward the cutting blade by pneumatic or hydraulic cylinders or similar actuators.

[0003] In order to achieve effective sharpening results the outer surface of the grinding wheels is coated with abrasive material, consequently during contact with the cutter disc, waste, dust and emery powder is produced that soils the product and is deposited on the various mechanical parts making up the cutting-off machine. This waste creates serious problems, causing a considerable increase in friction, particularly in all the mechanical parts subject to sliding. The main problems of friction occur precisely on the grinding wheel supports themselves, which are continually made to slide backward and forward to bring the grinding wheels in and out of contact with the cutter blades.

[0004] The object of the invention is to eliminate these drawbacks, providing a grinding wheel support assembly for sharpening circular and endless blades that is practical, economical and easy to produce.

[0005] This object is achieved according to the invention, with the characteristics listed in appended independent claim 1.

[0006] Preferred embodiments of the invention are made apparent by the dependent claims.

[0007] The grinding wheel support assembly for sharpening circular or endless blades comprises a system of guides with a prismatic or other geometric shape. The grinding wheel support can thus slide in these guides thanks to a compressed air pneumatic system , with dry or lubricated air according to requirements, which decreases the sliding friction between the guide and the grinding wheel support and at the same time ensures that they are clean by blowing out the waste caused by sharpening. In this manner, the waste caused by contact of the grinding wheels with the cutter disk is constantly blown away, thus avoiding dirt deposits on the product and on the mechanical parts of the cutting-off machine.

[0008] Further characteristics of the invention will be made clearer by the detailed description that follows, referring to a purely exemplary and therefore non-limiting embodiment thereof, illustrated in the appended drawings, in which:

Figure 1 is a side elevation view of the grinding wheel supporting assembly according to the invention;

Figure 2 is a front view, partially cut away, taken from the left of Figure 1;

Figure 3 is an enlarged cross section of the grinding wheel support guide, taken along the line III-III in Figure 1;

Figure 4 is a part-sectional side view of a slide of the grinding wheel support assembly according to the invention.

Figure 5 is a part perspective view of the slide in Figure 4.

[0009] The grinding wheel support assembly for sharpening circular or endless blades according to the invention is described with the aid of the figures.

[0010] A grinding wheel 7 which is substantially disc-shaped, is force-fitted onto a rotating shaft 6. The rotating shaft 6 is supported by a grinding wheel support 5 and is set in rotation by means of an electric motor M. The grinding wheel support 5 and the motor M are supported by a support 4 which is connected to a piston rod 3 of a pneumatic cylinder 2, mounted on a base 1. When the sharpening operation is to be carried out on the cutter disc of a cutting-off machine, the pneumatic cylinder 2, by means of the piston 3, pushes the support 4 and thus causes the grinding wheel to move forward and come into contact with the cutter disc.

[0011] Two slides 8 are connected integrally in the undersurface of the support 4, said slides having a substantially rectangular shape in section and having a cusp-shaped or V-shaped hollow 9 able to form a sliding track. The slides 8 are secured to the undersurface of the support 4, for example, by means of bolts passing through holes 19 made transversally in the slides 8 and screwing into the body of the support 4. It is obvious, however, that the slides 8 can be made in a single body with the support 4.

[0012] A through channel 10 is made longitudinally in each slide 8 passing through the whole length of the

slide. One end of the channel 10 is closed by means of a dowel or screw means 11 and the other end is joined to an air inlet channel 12, connected to the pneumatic system of the machine.

[0013] On each face of the V-shaped hollow 9 there is a longitudinal groove 14 that is put in communication with the respective channel 10 by means of transverse channels 13. When a flow of dry or lubricated air, according to requirements, is injected under pressure into the channel 10, this air flow exits from the transverse channels 13 and, following the grooves 14, sweeps the waste caused during sharpening from the surface of the V-shaped hollow 9.

[0014] Integrally locked above the base 1 is a prismatic guide 15 with a substantially T-shaped section, with the two lateral ends 16 having a pointed wedge shape, complementary to the V shape of the hollows 9 made in the slides 8. In this manner the slides 8, integral with the support 4 that supports the grinding wheel support 5, are free to slide along the guide 15, through engagement of the wedge-shaped ends 16 in the respective V-shaped hollows 9. When, as previously described, a flow of air is injected into the channels 10, this flow exits from the small holes 13 and diffuses over the surface of the V-shaped hollows 9 through the grooves, forming an air cushion between said hollows and the respective wedge-shaped ends 16 of the guide 15. This air cushion considerably reduces the sliding friction between the slides 8 and the guide 15.

[0015] In a further embodiment of the present invention, in addition to or in place of the channels 10 and the holes 13 made in the slide 8, provision can be made for one or more channels to be made longitudinally in the guide 15, put into communication by means of transverse holes with the two lateral surfaces of the wedge-shaped ends 16. When the flow of dry or lubricated air, according to requirements, is injected into said channels made in the guide 15, said flow spreads through the communication holes over the surfaces of the ends 16 of the guide 15 and over the surfaces of the hollow 9 producing the same anti-friction and cleaning effect obtained in the preceding embodiment.

[0016] It is also obvious that the position of the slides 8 and the guide 15 can be inverted with respect to what was previously described and illustrated in the drawings. In other words, the slides 8 can be made integral with the base 1, acting as guides, and the guide 15 can be made integral with the support 4, acting as a slide.

[0017] Numerous modifications can be made to the details of the invention, without departing from the scope thereof.

Claims

1. A grinding wheel support assembly for sharpening circular or endless blades, particularly for cutting-off machines, comprising a support (4, 5) able to support a shaft (6) at the end of which is force-fitted a grinding wheel (7) which is set in rotation by a motor (M) and a cylindrical actuator (2) driving said support (4, 5) to cause said grinding wheel (7) to move forward or backward, characterized in that said support (4, 5) slides on a system of guides.

2. A grinding wheel support assembly according to claim 1, characterized in that said system of guides comprises at least one slide (8), mounted integrally to the undersurface of said support (4), sliding in a guide (15) fixedly mounted on a base (1), or vice versa.

3. A grinding wheel support assembly according to claim 2, characterized in that said at least one slide (8) comprises a hollow (9) able to engage in a sliding relationship with a corresponding end (16) of said guide (15).

4. A grinding wheel support assembly according to claim 3, characterized in that said hollow (9) and said end (16) of the guide (15) have a V-shape and a complementary wedge shape, respectively.

5. A grinding wheel support assembly according to claim 3 or 4, characterized in that between the sliding surfaces of said hollow (9) and of said end (16) of the guide (15) an air flow is provided such as to clean said surfaces and reduce the sliding friction therebetween.

6. A grinding wheel support assembly according to claim 5, characterized in that said air flow is a flow of lubricated air.

7. A grinding wheel support assembly according to claim 5 or 6, characterized in that said air flow is injected between said sliding surfaces through at least one channel (10) made longitudinally in said at least one slide (8) and is put in communication, by means of at least one small transverse channel (13), with the surface of said hollow (9).

8. A grinding wheel support assembly according to claim 7, characterized in that at least one said transverse channel (13) opens into a corresponding groove (14), disposed longitudinally along the surface of the hollow (9), so as to convey said air flow uniformly onto the entire surface of the hollow (9).

9. A grinding wheel support assembly according to claim 5 or 6, characterized in that said air flow is introduced between said sliding surfaces though at least one channel made longitudinally in said guide (15) and put into communication, by means of at least one small transverse channel, with at least one of said end surfaces (16) of the guide (15).

10. A cutting-off machine for cutting rolls of sheet material, characterized in that it comprises a grinding wheel support assembly for sharpening the cutter blade, according to any one of the preceding claims.

FIG. 1

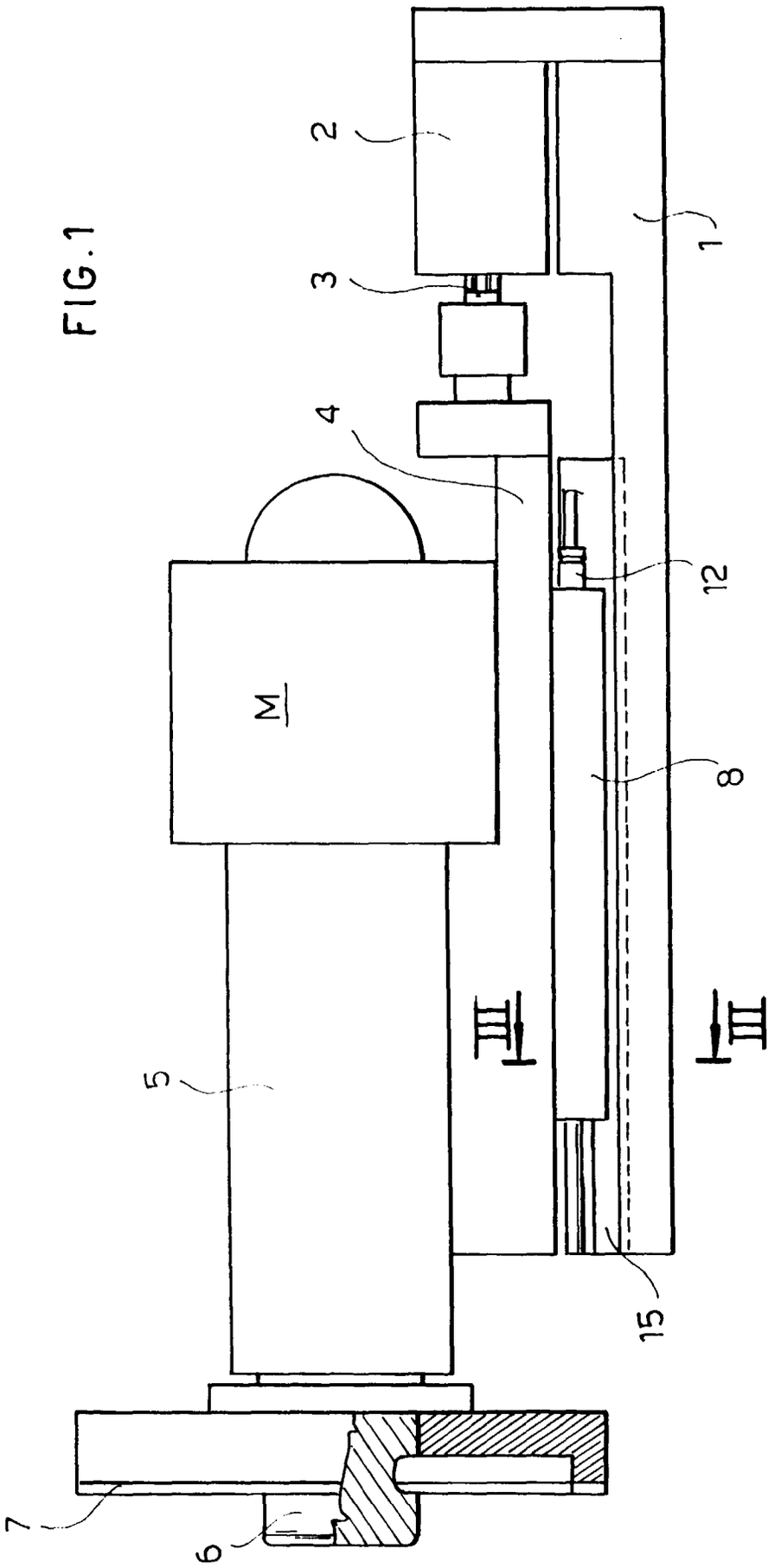
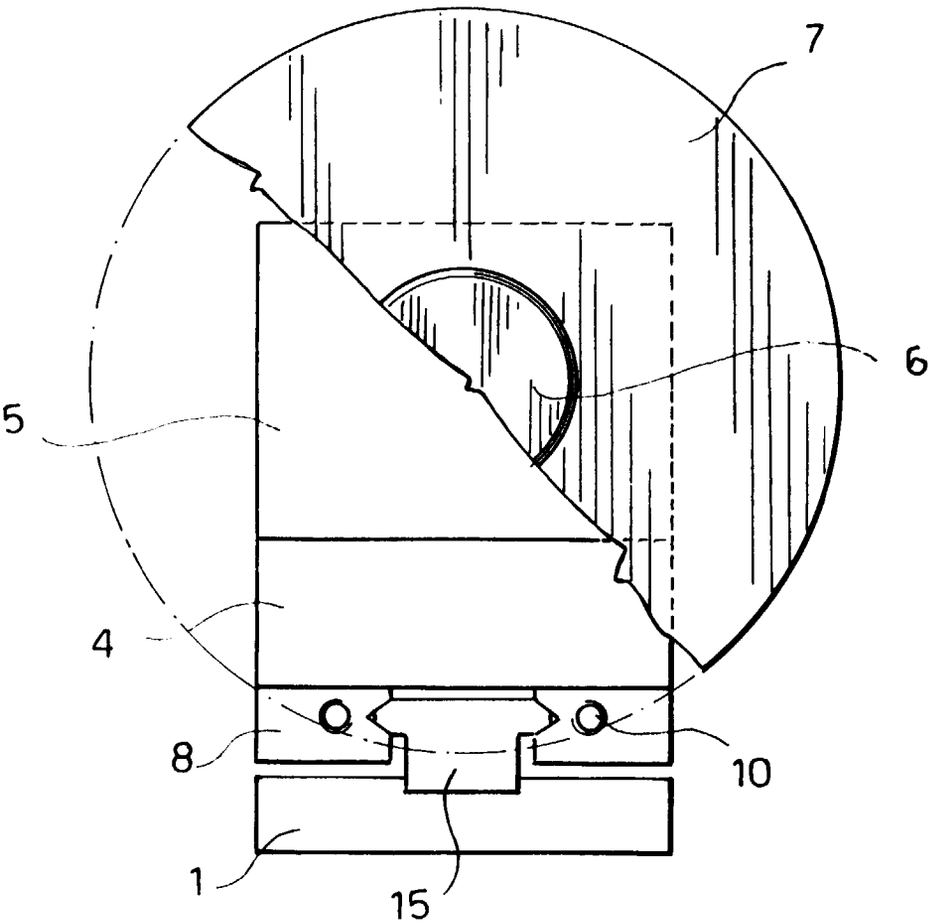


FIG.2



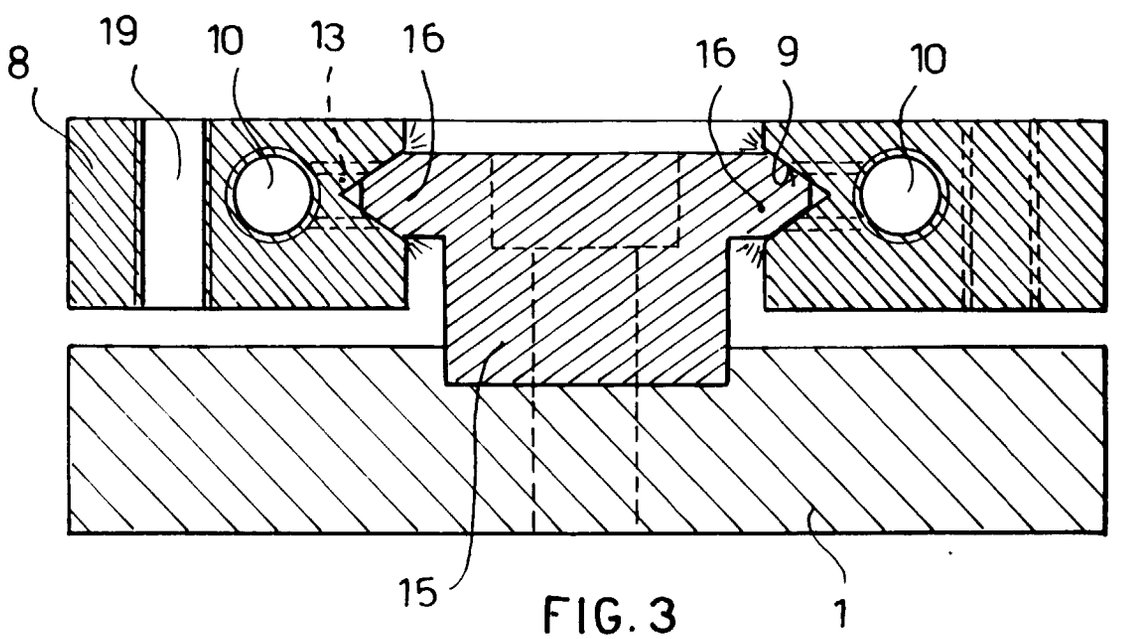


FIG.3

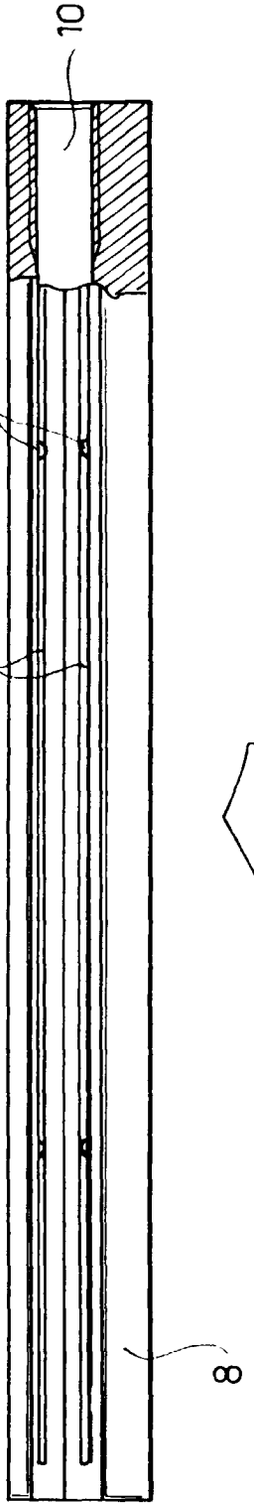


FIG. 4

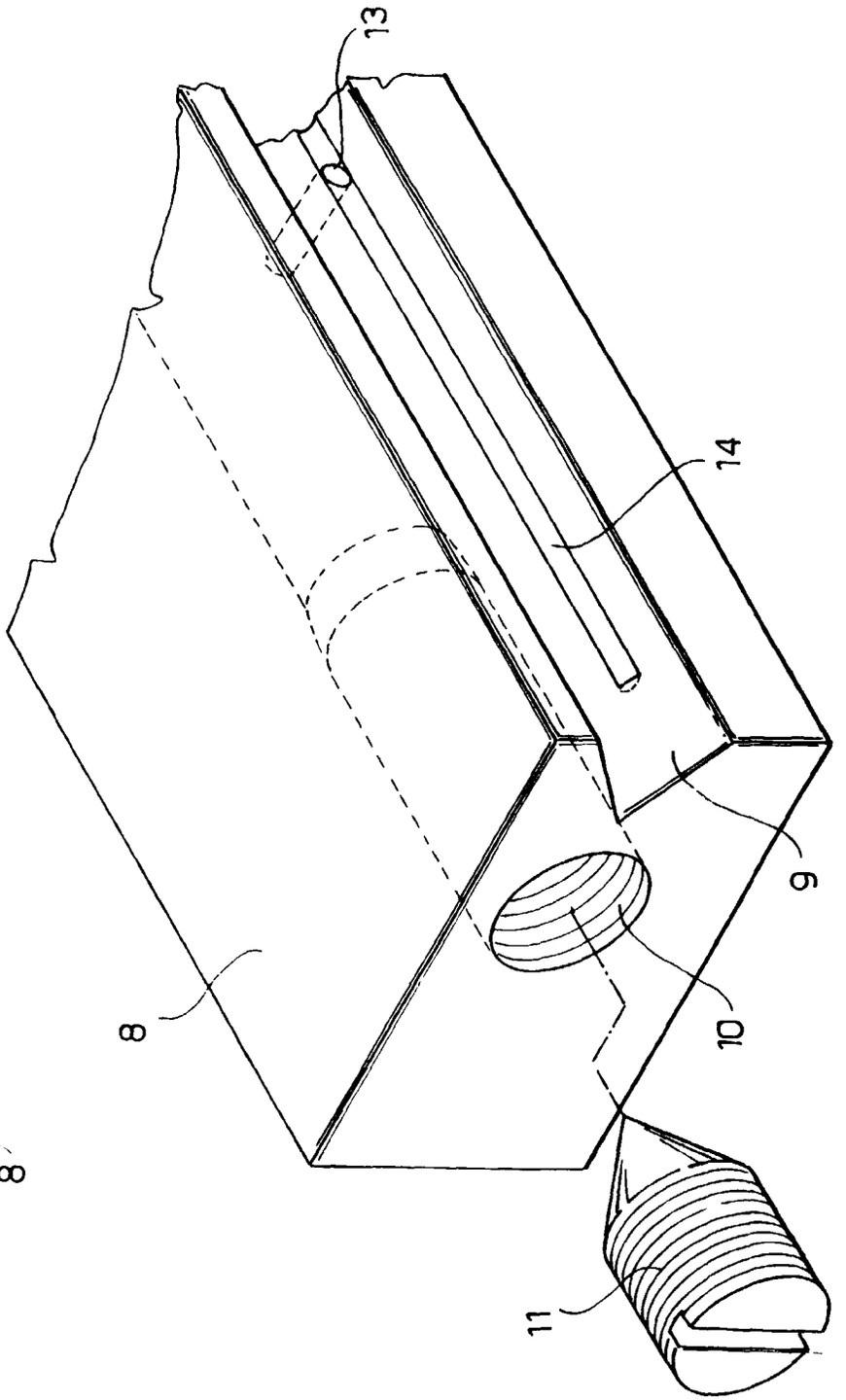


FIG. 5