May 25, 1965 H. SOLLICH 3,185,129

APPARATUS FOR DECORATING FILLED CHOCOLATES, PASTRY, AND THE LIKE

Filed Dec. 14, 1961 2 Sheets-Sheet 1

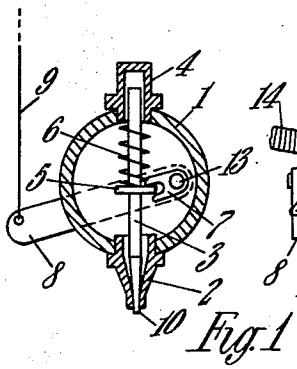

Fig. 1

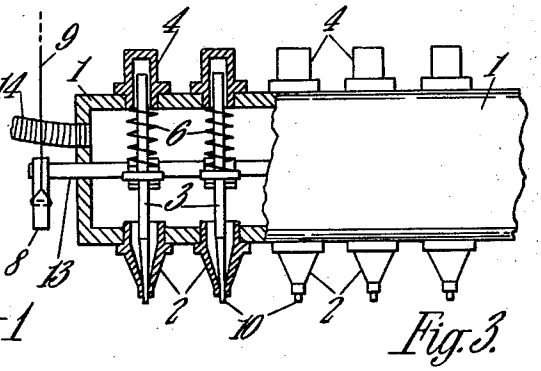

Fig. 3.

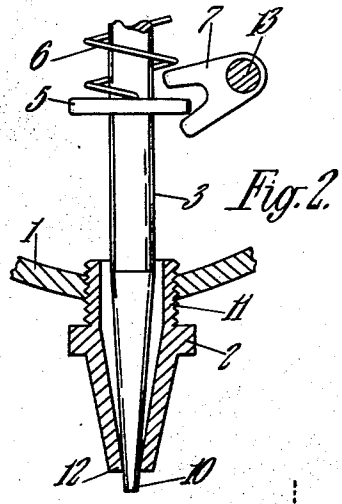

Fig. 2.

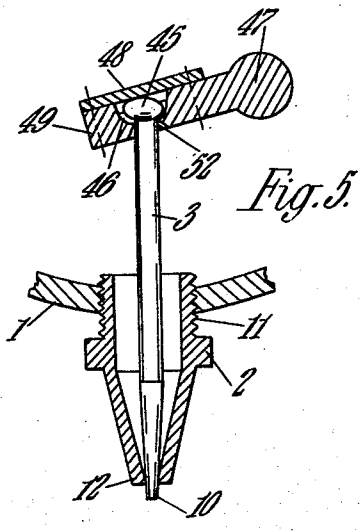

Fig. 5.

Fig. 4.

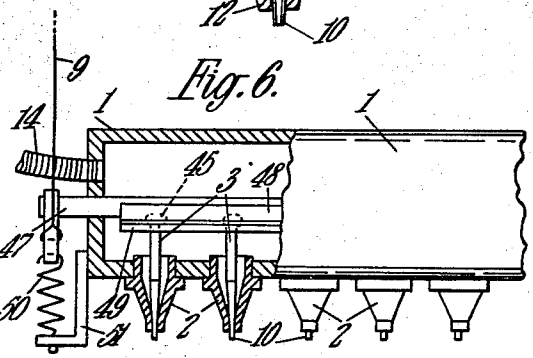

Fig. 6.

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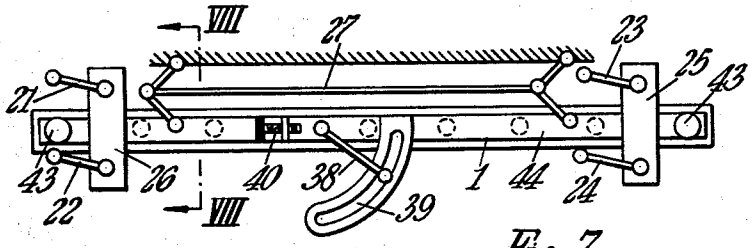


Fig. 7.

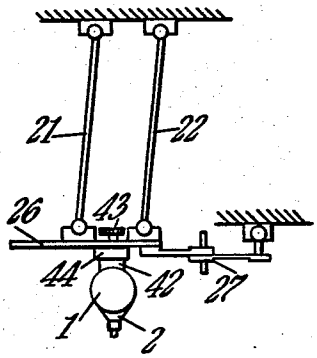
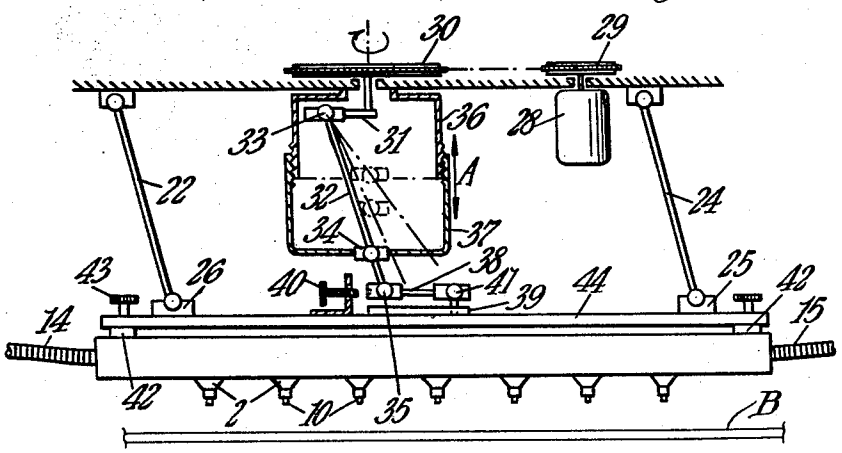


Fig. 8.

Fig. 9.



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3,185,129

APPARATUS FOR DECORATING FILLED CHOCOLATES, PASTRY, AND THE LIKE

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10 Claims. (Cl. 118—14)

This invention relates to an apparatus for the partly automatic or fully automatic decoration of filled chocolates, pastry, and the like with a mass which in the working condition is liquid or viscous but later hardens spontaneously or is hardened by a suitable process, and which is applied to the objects to be decorated in the form of dots or simple or artistically intertwined lines.

It is known to apply decorations of this kind to the objects mentioned by using simply twisted parchment bags, the tips of which are cut off so that a small opening is produced at that point. These paper bags are filled with the decoration mass and twisted together at the top, so that slight pressure applied to the filled bag causes the contents to pass out in a strip of greater or lesser thickness depending on the size of the opening at the tip of the bag, so that it can thus be applied to the objects to be decorated. Bags are also known the opening of which, at the tip of the bag, is provided with a mouth piece of metal, plastic, or the like, while the outlet of the mouth piece can have different shapes, for example the shape of a star, semicircular, rectangular, or simply round, so that the strip passing out of the bag is of corresponding shape.

These known methods are very uneconomical, because, whether the decorations are simple or complicated in design, the work must in every case be done by hand. Depending on the goods to be decorated, this work requires more or less staff, who in addition must have a certain dexterity. In the decoration of filled chocolates, the decorating operation must frequently be carried out directly after the coating operation. The chocolate-coated objects are then taken from the cooling belt following the coating machine and the work of decoration is carried out in the manner described above on the so-called decorating table. Since the work takes place continuously and a coating machine can have a considerable capacity, a large staff is sometimes required for this work. With a coating machine with a belt width of 60 cm., up to 10 persons are occasionally used for this work. Additional staff are also required for preparing the decoration mass, filling and distributing the decorating bags, and collecting the empty bags. Greater width of the belts makes the work of decoration difficult, so that widths in excess of 60 cm. cannot be used for this work.

The apparatus according to the present invention eliminates these shortcomings and permits rationalisation of the respective production operation by automation, the degree of which can be selected to any desired extent up to completely automatic decoration, with any belt width and with a saving in personnel.

The present invention consists in a device for decorating confectionery products, wherein a number of adjustable nozzles are suspended above the products for movement in a generally horizontal plane, and means are provided for adjusting the opening of the nozzles during the ejection of a decorating material through the nozzles onto the products.

According to the invention, a plurality of nozzles, which can be opened and closed to any desired extent by means of a nozzle needle, are inserted in the underside of a nozzle tube, side by side, while through their corresponding shape and through their points which when the nozzles are closed project out of the nozzle mouth the nozzle needles simultaneously clean the nozzles, when the latter are opened and closed, by removing impurities in the decoration mass or any decoration mass which has coagulated. The decoration mass is pressed into the nozzle tube and distributed by the latter to the nozzles under pressure, and the nozzle tube is so suspended over the objects to be decorated as to be horizontally movable and by means of a mechanism moving it can be caused to perform a circular movement or a reciprocating movement in any direction, which can be regulated as desired.

The nozzle tube can be fed from the centre of the tube, but is preferably fed from one end of the tube, while the opposite end can be provided with an outlet aperture for excess mass, which is then fed back to the tempering machine or to a storage vessel.

The apparatus according to the invention can be used both over a decorating table on which the objects to be decorated are not in movement, and also preferably over a conveyor belt on which the objects to be decorated are transported. If the apparatus according to the invention is used for example in conjunction with a coating machine, the apparatus can be disposed both above the grid belt of the coating machine and also at another point, for example above the cooling belt following the coating machine.

Further details of the invention will be clear from the following description of one example of the construction of the apparatus according to the invention, which is illustrated in the accompanying drawings, in which:

FIGURE 1 shows a section through the nozzle tube with a nozzle in section and with the nozzle needle situated therein,

FIGURE 2 shows a detail of FIGURE 1 on a larger scale with the nozzle in section and the bottom part of the nozzle needle,

FIGURE 3 shows a longitudinal view, partly in section, of the nozzle tube according to the invention,

FIGURE 4 shows a section corresponding to FIGURE 1 of another form of construction of the apparatus according to the invention,

FIGURE 5 shows a detail on a larger scale, corresponding to FIGURE 2, of the embodiment illustrated in FIGURE 4,

FIGURE 6 shows a longitudinal view corresponding to FIGURE 3 of the embodiment illustrated in FIGURE 4,

FIGURE 7 is a plan view of the nozzle tube, showing the suspension and moving device,

FIGURE 8 is a view in section on the line VIII—VIII in FIGURE 7, and

FIGURE 9 is a longitudinal view corresponding to FIGURE 3 and FIGURE 6, showing the suspension and moving device for the nozzle tube.

FIGURES 1 and 2 show a nozzle tube 1 on the underside of which a nozzle 2 is situated. The nozzle 2 carries at its top end a screwthread 11 by which the nozzle can be screwed to any selectable depth into the nozzle tube. The nozzle itself converges conically in the known manner in the direction away from the nozzle tube and ends in a nozzle mouth 12. A nozzle needle 3 is mounted in the nozzle 2, passing through the nozzle tube 1 and slightly projecting out of the nozzle tube 1, in relation to the nozzle 2, through an opening in the nozzle tube 1. A guide cap 4 is screwed into the said opening and closes the opening in the nozzle tube 1 tightly, the nozzle needle 3 being guided in its hollow cylindrical interior. The cylindrical nozzle needle 3 converges conically at its lower end lying in the nozzle 2 and in the lowered position closes the nozzle mouth 12. The bottom end 10 of the nozzle needle projects slightly out of the nozzle mouth 12. Inside the nozzle tube 1 the nozzle needle 3 is provided with a plate disc 5. Between the plate disc 5 and the lower edge, extending into the interior of the nozzle tube

1, of the guide cap 4 the nozzle needle is surrounded by a restoring coil spring 6. A forked lever 7 embraces the plate disc 5 by the prongs of its fork and is fastened on a shaft 13. The shaft 13 runs through the nozzle tube 1 in the longitudinal direction, strikes at one end against the closure plate of the nozzle tube 1, and outside the latter carries a lever 8 which can be rocked by means of a Bowden cable 9 or of a corresponding linkage or other suitable devices, thereby imparting a rocking movement to the forked lever 7 fastened thereon, through the shaft 13.

FIGURE 3 shows the arrangement according to the invention of a number of juxtaposed nozzles in a nozzle tube 1 and the arrangement of the shaft 13, with the forked levers 7 fastened thereon and the lever 8 with the Bowden cable 9. An elastic tube 14 leads into the head plate of the nozzle tube 1 for the purpose of feeding into the nozzle tube the decorating material to be distributed through the nozzles.

The apparatus works in the following manner: The decoration material coming from a tempering machine or from a storage container or the like is delivered under superatmospheric pressure through the tube 14 into the nozzle tube 1. It is advantageous for the amount of the superatmospheric pressure to be regulable for the purpose of adaptation to the viscosity of the decoration mass and for the purpose of regulating the amount of the mass passing out of the nozzles and the thickness of the decorative strip. It may be advantageous for another tube 15 (FIGURE 9) to be provided at the opposite end of the nozzle tube for the purpose of removing the excess decoration mass.

In the condition of rest, that is to say as long as no decoration material is passing out of the nozzles, the restoring springs 6 press the nozzle needles 3 so far into the nozzle mouth 12 that through their conical shape the nozzle needles 3 tightly close the nozzles 2. When it is desired to decorate, that is to say when it is desired that decoration material should pass out of the nozzles, the lever 8 is raised by pulling the Bowden cable 9. The shaft 13 is thus rotated to the same extent in the upward direction, thereby rocking the forked lever 7 in the upward direction. The prongs of the forked lever 7 which engage around that plate discs 5 of the nozzle needles 3 push the nozzle needles 3 upwards, when they are rocked, by means of the plate discs 5 and against the action of the restoring springs 6, so that the nozzles are opened and the decoration material which is under pressure can pass out of the nozzles. On their upward movement, the upper end of the nozzle needles 3 is pushed more deeply into the guide caps 4, the latter simultaneously effecting the vertical guiding of the needles. The thickness of the strip of decoration material passing out is naturally dependent not only on the magnitude of the superatmospheric pressure in the nozzle tube, but also on the magnitude of the upward movement of the nozzle needle 3, that is to say on the selective raising of the lever 8 by the Bowden cable 9.

When the Bowden cable is released again, the nozzle needles 3 are lowered by the restoring springs 6 and close the nozzles 2. Through their fit in the nozzles and through the projecting ends 10 of the nozzle needles, the latter clean the nozzle cavities by removing any coagulated decoration mass attached there, and push out any crumbs or small lumps of decorating material which may be hanging in the nozzles.

During the decoration the objects to be decorated are preferably guided past under the nozzles on a conveyor belt B. The material can then pass continuously out of the nozzles, but is preferably effected by rhythmic opening and closing of the nozzles, while not only the interruption of the decorating operation but also the very important cleaning of the nozzle apertures are carried out automatically. The interruption of the decorating current can take place once, in order to eject decoration material only when an object to be decorated is actually under the nozzle. On the other hand, the interruption of the decoration current can also be effected when material to be decorated is under the nozzles, in order to achieve special effects by means of interrupted decorative lines. In every case however the operations can be controlled both by hand and by periodic timing means, electrical or mechanical sensing, or the like, while in the case of such automatic control of the operation by sensing it is in any case advantageous for the opening time of the nozzles to be made adjustable, so that it is possible to determine not only the previously determinable timing of the commencement of the opening but also the ejection time of the nozzles.

It should be added that the nozzle mouths 12 can have sizes and shapes determined by requirements, in order to obtain suitably shaped decorative strips. The screw-threads 11 ensure rapid and easy exchangeability of the nozzles. Similarly, it is easily possible, for the purpose of obtaining different decorative effects and for adaptation to decoration requirements, for certain of the nozzles disposed side by side in the nozzle tube 1 to be put out of operation by the insertion of blind nozzles or by other suitable means.

The form of construction of the nozzle tube 1 described so far ensures through the precise guiding of the needles 3 in the guide caps 4, with the simultaneous provision of restoring spring 6 on each nozzle, the perfect operation of the apparatus even with a very viscous decoration mass which easily coagulates. In FIGURES 4 to 6 another form of construction of the nozzle tube according to the invention is illustrated, the particular advantage of which consists in that the nozzle tube can be taken apart very simply if cleaning should be required. The modification as compared with the previously described embodiment consists in that the nozzle needle 3 now does not pass through the nozzle tube 1 but inside the nozzle tube in the form of a spherical head 45. A shaft 47 running longitudinally through the nozzle tube is provided with a bar 49 which carries panlike depressions 46 above the nozzles 2. In the middle of these depressions 46 a bore 52 is provided. The nozzle needles 3 engage in these bores 52 in such a manner that the spherical heads 45 come to lie in the respective depressions 46, while the bores 52 on the one hand allow the nozzle needles 3 sufficient play for their movability, but on the other hand guide them and hold the heads 45 securely. The depressions 46 are covered from above by a cover bar 48. The shaft 47 passes out of the nozzle tube on one side and there carries a lever 8 with a Bowden cable 9 or other suitable moving device, as already described with reference to the first embodiment. A single restoring spring 50, which acts on the lever 8, is fastened on a lever 51 which is jointed rigidly to the nozzle tube.

The apparatus works in accordance with the apparatus described with reference to FIGURES 1 to 3, in the following manner:

In the position of rest, that is to say as long as no decoration mass passes out, the restoring spring 50 pulls the lever 8 downwards. The shaft 47 is thereby rocked downwards, in such a manner that the nozzle needles 3 are pressed downwards into the nozzle mouth and thus close the nozzles 2 tightly. When it is desired to decorate, that is to say when it is desired that decoration material should pass out of the nozzles, the lever 8 is raised against the action of the spring 50 by pulling the Bowden cable 9. The shaft 47 is thus rotated to the same extent upwards and with it raises the bar 49 and the nozzle needles 3 held in the bar 49, so that the nozzle openings are freed and decoration material flows out. The thickness of the strip of decoration material passing out is here again regulable through the magnitude of the movement of the lever 8. By means of stops (not shown) on the lever 8 the nozzle needles 3 are prevented when lifted from passing out of

the upper edge of the nozzles 2, so that the reliable guiding of the needles in the depression 46 and the nozzles 2 is ensured.

It can be seen that this arrangement permits easy dismantling of the apparatus according to the invention for cleaning purposes, and also rapid re-assembly. After removal of the stop referred to, the shaft 47 with the bar 49 is swung completely upwards, so that the nozzle needles 3 pass out of the nozzles 2. The shaft 47 with the nozzle needles 3 suspended on it can then be drawn sideways out of the nozzle tube 1 and cleaned. Re-assembly takes place in the reverse manner.

The selective control so far described for the opening and closing operation, with simultaneous movement of the objects to be decorated beneath the nozzle on a conveyor belt, already provides numerous possible variations of the decorative effects obtainable with the apparatus according to the invention. These possibilities are however increased in number by the suspension and moving devices for the nozzle tube which are illustrated in FIGURES 7 to 9 and described below.

FIGURES 7 to 9 illustrate the suspension of the nozzle tube 1 by means of two knurled screws 43 on a rod 44 which in turn is fastened by two plates 25 and 26 to four swinging rods 21, 22, 23, 24. The free movability of the rod 44 and hence of the nozzle tube 1 resulting from the swinging rods is restricted by a parallel guide linkage 27, in such a manner that the nozzle tube 1 always performs translatory movements. Through belt pulleys 29 and 30 a regulable motor 28 drives an eccentric 31, which through a connecting rod 32 guided in the three spherical bearings 33, 34 and 35, a lever 38, and a segment 39 mounted on the rod 44 transmits its movements to the rod 44 and the nozzle tube 1 rigidly joined to it. The middle spherical bearing 34 is mounted on a threaded bush 37, which can be screwed over the threaded bush 36 in the directions of the arrow A (FIGURE 9). The threaded bush 36 is fastened rigidly on a support over the nozzle tube. When the threaded bush 37 is screwed up and down on the threaded bush 36, the bearing 34 is displaced, which slidably embraces the connecting rod 32 in the manner indicated in broken lines in FIGURE 9, whereby the deflection of the bottom end of the connecting rod 32 is varied accordingly. By means of a fastening screw 40 which is mounted on the rod 44 the bearing 35 can be held fast at the bottom end of the connecting rod 32.

The above-described suspension and moving device works in the following manner:

If the eccentric 31 is rotated by the motor 28 through the belt pulleys 29 and 30, the connecting rod 32 articulated on it moves on a path which corresponds to the surface of a double cone with apices resting on one another. The apices of these cones lie in the middle bearing 34 of the connecting rod 32. The magnitude of the deflection of the bearing 35 is dependent on the vertical position of the middle bearing 34, the height of which is determined by screwing the bush 37 up and down. When the bearing 34 is in its highest position, the deflection of the bearing 35 is at its greatest value. If the bearing 35 is held fast by the fastening screw 40, all points on the rod 44 and the nozzle tube 1 follow the circular movement of the bottom end of the communicating rod 32 and describe circles, while the rod and tube perform translatory movements because of the linkage 27. If on the other hand the fastening screw 40 is slackened and the bearing 35 thus released, the circular movement of the rod 44 becomes a reciprocating movement while the bearings 35 and 41 with the lever 38 take the corresponding circular movement component through a rocking movement. In this latter case the movement of the bottom end of the connecting rod is transmitted to the rod 44 through the lever 38 and the segment 39. One end of the lever 38 can slide in the segment 39 and be fastened in any desired position. It is thus possible to vary the plane of oscillation of the rod 44 and hence of the nozzle tube 1 by up to 90°, that is to say through the movement device the rocking to and fro of the nozzle tube 1 can be effected both in the plane of the drawing in FIGURE 9 and in the plane of the drawing of FIGURE 8 and in all intermediate planes, while however the tube always remains in parallel vertical planes.

It can be seen that through the described moving and suspension device the nozzle tube 1 can be given any type of horizontal movement, while these movements can be both circular with different radii and also oscillatory with varying amplitude and speed. The regulability of the motor 28 permits not only regulation of the speed but of course also periodic interruption of the movement.

When the type of decoration so requires, the entire apparatus can also be mounted on rollers, in order to move, at the time of the decoration operation, in the direction of the conveyor belt carrying the objects to be decorated and at the speed of the said belt, and finally to return to the position of rest, until the operation is repeated.

By means of the knurled screws 43 the nozzle tube can be rapidly and easily detached from the moving device and replaced by another nozzle tube, in the event of other nozzles or another nozzle arrangement being required to produce a new decorative effect.

It need scarcely be explained that with the aid of the moving and suspension device in conjunction with the above-described control of the nozzle needles and the exhangeability of the nozzles and of the nozzle tube almost any type of decoration is possible and can be rendered rational by complete automation.

I claim:

1. In a device for decorating confectionery products; tube means; a plurality of nozzles therein; axially reciprocable needles for said nozzles for opening and closing said nozzles; means for reciprocating said needles; means mounting said tube means for swinging translatory movements in a substantially horizontal plane in paths angularly disposed to one another; and adjustable means for effecting said movements.

2. The combination defined in claim 1 in which a number of parallel swinging rods suspend said tube means.

3. The combination defined in claim 1 in which said means mounting said tube means and means effecting said movements comprise drive motor means; a depending connecting rod connected with said tube means through a rod attached to said tube means; vertically adjustable support means for said connecting rod intermediate the ends of said connecting rod; and spherical bearings connecting said connecting rod with said drive motor means, said support means, and said tube means.

4. The combination defined in claim 3 in which said connecting rod connects at its lower end to a lever connected to a segment having a curvilinear slot therein which is secured to said rod; and means on said rod is selectively actuatable to engage and hold said lever.

5. A device for decorating confectionery articles with a mass in liquid working condition, said device comprising a nozzle tube, a plurality of nozzles mounted on the under side of said tube, axially reciprocable needles for said nozzles for opening and closing said nozzles, means for reciprocating said needles between a nozzle closing position and a nozzle opening position, means for introducing a decorating mass into said tube, means suspending said tube for swinging translatory movements in a substantially horizontal plane in paths angularly disposed to one another, and means for effecting said movements.

6. A device as claimed in claim 5 wherein the nozzle tube is rigidly but detachably fastened to a rod, and the rod is suspended by means of swinging rods.

7. A device as claimed in claim 6 wherein the rod is connected to a regulable motor through a linkage comprising an eccentric operably connected with the motor shaft, a connecting rod attached at one end of the eccentric by a first spherical bearing, a lever attached at one

extremity to the other end of said connecting rod by a second spherical bearing, a curved segment rigidly attached to the rod and adjustably mounting the opposite extremity of said lever, and a third spherical bearing forming a pivot for said connecting rod at an intermediate point on the length of said connecting rod.

8. A device as claimed in claim 7 which includes an adjusting screw mounted on the rod with its axis horizontal, for selectively restricting pivotal movement of said second spherical bearing.

9. A device as claimed in claim 7 wherein said third spherical bearing is mounted for sliding movement along said connecting rod.

10. A device as claimed in claim 9 wherein said third spherical bearing is carried by a threaded bush, associated in screw engagement with another threaded bush fixedly mounted above the rod, relative screwing and unscrewing of said bushes effecting said sliding movement of the third spherical bearing.

References Cited by the Examiner

UNITED STATES PATENTS

497,763	5/93	Campbell	118—323 X
1,489,516	4/24	Bertolus	118—323
1,709,969	4/29	Bright	118—323 X
1,987,046	1/35	Bergner	118—323 X
2,010,195	8/35	Meehan	239—117
2,145,861	2/39	Casto	118—323
2,343,034	2/44	Weber	239—117 X
2,770,216	11/56	Schock	118—323
2,834,218	5/58	Lovell	74—86

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