



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
07.09.2005 Bulletin 2005/36

(51) Int Cl.7: **B05C 5/02**

(21) Application number: **05101611.1**

(22) Date of filing: **02.03.2005**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR
 Designated Extension States:
AL BA HR LV MK YU

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(30) Priority: **02.03.2004 IT TV20040020**

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(54) **Spreader particularly for depositing adhesives and/or polymeric materials in a liquid dispersion**

(57) A spreader (1) particularly for depositing adhesives and/or polymeric materials in a liquid dispersion,

comprising a head (5) that is detachably associable with a footing (2), and electromechanical means (6) for detachably locking the head to the footing.

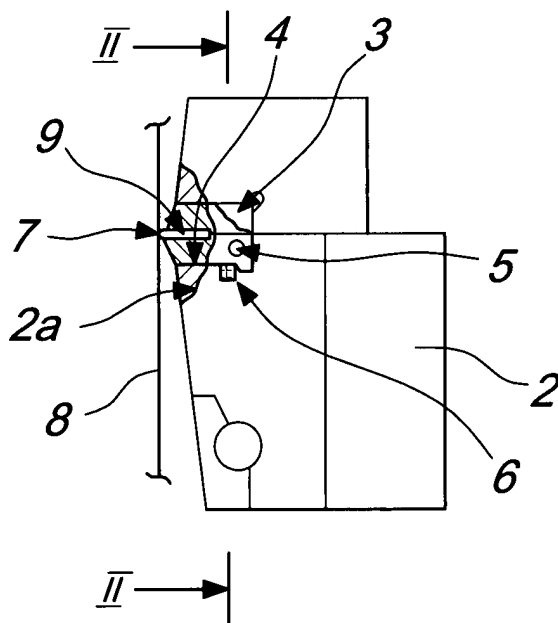


Fig. 1

Description

[0001] The present invention relates to a spreader particularly for depositing adhesives and/or polymeric materials in a liquid dispersion.

[0002] Currently, it is known to spread adhesives or polymeric materials in a liquid dispersion, known as coating, on backing media made of various materials, such as woven or non-woven fabrics, by using spreaders constituted by a head that is provided with a duct that is open at a working surface of said head and generally has a rectangular cross-section.

[0003] The head is formed at, or is detachably connected to, a footing that supports it, and it contains devices for injecting the coating into the duct; such coating is thus applied, at the working surface of the head, to a backing medium that is made to slide thereon in close contact in the form of a tape.

[0004] In order to allow the application of these adhesives or polymeric materials in liquid dispersion on backing media constituted by tapes of various widths, known throttling devices are applied to the spreading head and allow to adapt, to a certain extent, the breadth of the duct to the width of the tape that slides in contact therewith.

[0005] In view of the high travel speed of the backing medium with respect to the working surface of the head, the adoption of ducts that are even slightly wider than the tape in fact entails the waste of large amounts of coating, which in view of the low profit margins that can be achieved in this industrial sector is extremely penalizing from the economic standpoint, thus making it inevitable to apply said throttling devices.

[0006] A first known type of throttling device consists of one or more inserts, which can be arranged inside the duct in order to adapt its width to the width of the tape that slides in contact with it, partially obstructing its cross-section.

[0007] The main drawback of this first known type of throttling device is that positioning these inserts entails a long downtime of the spreader, worsened by the fact that due to the high travel speed of the backing medium the head reaches very high temperatures.

[0008] Moreover, these known types of insert only allow a stepwise adjustment of the width of the duct, forcing a considerable approximation in adapting it to the actual dimensions of the tape of backing medium.

[0009] A second throttling device is also known which comprises mechanical actuation systems for positioning inserts within the duct in order to vary its breadth without requiring external intervention on the spreader.

[0010] The main drawback of this second known type of throttling device is that these mechanical actuation systems, arranged laterally to the spreading head, have large dimensions.

[0011] Another drawback of this second throttling device is that particles of coating can often be deposited at the mechanical actuation systems and can undergo,

due to the high temperatures, chemical and physical alterations, such as carbonizations or polymerizations, and be subsequently released into the duct, contaminating the coating that flows therein, and can accumulate, obstructing part of the duct.

[0012] A third known type of throttling device consists of a series of valves, for example needle valves, each of which feeds a separate section of the duct and is separately adjustable, so as to adjust the breadth of said duct according to the number of separate sections that are fed.

[0013] The main drawback of this third known type of throttling device is that it entails a considerable increase in production costs due to the large number of valves required.

[0014] Another drawback is that even in this case the adjustment of the breadth of the duct is stepwise and therefore poses a considerable limitation to its adaptation to the actual dimensions of the tape of backing medium.

[0015] A fourth throttling device is also known which is constituted by a lamina that can be inserted transversely within the duct and can be fixed thereat in a chosen position, so as to determine its width with a good degree of precision.

[0016] The main drawback of this fourth known type of device is that in order to position said lamina it is necessary to disassemble most of the spreading head, and this operation is particularly labor-intensive and therefore forces long production stops, with a consequent decrease in the productivity of the spreader.

[0017] A known variation of this last fourth known type of throttling device allows to position the lamina by virtue of hydraulic actuation means, allowing to achieve the intended adjustment rapidly and with good precision.

[0018] The main drawback of said variation is that if the liquid contained in the hydraulic actuation circuit leaks due to damage to the gaskets as a consequence for example of the high operating temperatures, said liquid can spill onto the tape of backing medium or mix with the stream of coating, causing in both cases a deterioration of the final product that is particularly damaging, since its effects can become apparent even after a considerable period of use.

[0019] Another drawback of this known type of device is that the hydraulic actuation means are bulky and expensive to install and operate.

[0020] Another drawback of known types of spreader is that if depositions of different coatings are alternated on the same apparatus, said coatings can become contaminated due to the presence, inside the duct of the head, of particles that have accumulated during previous work.

[0021] The aim of the present invention is to solve the above-mentioned problems, eliminating the drawbacks of the cited background art, by providing a spreader for depositing adhesives and/or polymeric materials in a liquid dispersion on a tape of backing medium, which is

capable of ensuring its easy, quick and effective optimization according to the type of coating that is deposited and according to the chosen dimensions of the backing medium.

[0022] Within this aim, an object of the present invention is to provide a device that allows to ensure stable and reliable fixing of the head to the footing of the spreader.

[0023] Another object is to provide a spreader that is compact and highly reliable in operation and has low operating costs.

[0024] Another object of the invention is to allow its operation and optimization without the presence of specialized personnel, thus reducing labor costs.

[0025] Another object is to provide a spreader that is structurally simple and has low manufacturing costs.

[0026] This aim and these and other objects that will become better apparent hereinafter are achieved by a spreader particularly for depositing adhesives and/or polymeric materials in a liquid dispersion, comprising a head that is detachably associable with a footing, characterized in that it comprises electromechanical means for detachably locking said head to said footing.

[0027] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a particular but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a partially sectional side view of a spreader according to the invention;

Figure 2 is a sectional view, taken along the line II-II of Figure 1, of a spreader;

Figure 3 is a partially sectional side view of a second embodiment of the spreader according to the invention;

Figure 4 is a sectional view, taken along the line IV-IV of Figure 3, of a spreader;

Figure 5 is a side view of a third embodiment of the spreader according to the invention;

Figure 6 is a sectional view, taken along the line VI-VI of Figure 5, of the spreader;

Figure 7 is a partially sectional side view of a variation of the spreader according to the invention;

Figure 8 is a sectional view, taken along the line VI-II-VIII of Figure 7, of a variation of the spreader.

[0028] In the embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other embodiments.

[0029] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0030] With reference to the figures, and considering their chosen orientation merely for page layout purposes, the reference numeral 1 designates a spreader,

which is composed of a footing 2 that is shaped approximately like a parallelepiped and is provided with a first seat 3, which is arranged horizontally along part or all of the width of the footing 2 and is open on at least one front face 2a of the footing.

[0031] Inside the footing 2, proximate to a lower end face 4 of the first seat 3, there are electromechanical means for locking a spreading head 5, which can be accommodated partially within the first seat 3.

[0032] Such electromechanical means are constituted, in a first embodiment of the invention, by at least one first magnet 6, which is preferably operated electrically and is provided for example by means of a coil of electrically conducting material arranged substantially horizontally along all or part of the width of the footing 2.

[0033] The at least one first magnet 6, moreover, can be positioned proximate to the end face 4 of the first seat 3, which is termed lower end face for the sake of convenience in description.

[0034] The at least one first magnet 6 is powered by an electric power source, such as the electrical mains, while the intensity of the current that flows through it is regulated by means of an electronic control and adjustment device, which is interposed between the at least one first magnet and the electrical mains.

[0035] The spreader further has means for shielding any sensors provided inside it, for example for measuring the temperature of various components thereof or the travel speed of the tape of backing medium, from the magnetic fields generated by the electromagnetic locking means particularly during the transitions for their activation and deactivation.

[0036] Such shielding means consist, for example, of an electronic circuit that is capable of deactivating and reactivating the sensors automatically during the transitions of the operation of the electromagnetic locking means.

[0037] The head 5 is substantially shaped like a parallelepiped and mates, with at least one portion, with the lower end face 4 of the first seat 3 and runs horizontally along all or part of said first seat.

[0038] Conveniently, a part of the head 5 can match the shape of the first seat 3 and be slightly smaller than said seat in order to allow its insertion therein.

[0039] The head 5 further has, at the opening of the first seat 3, a working surface 7 that protrudes externally from the front face 2a of the footing 2, in contact with which the tape of backing medium 8 can slide.

[0040] The head 5 is at least partially made of magnetic material, so as to be sensitive to the action of the magnetic field generated by the electromagnetic locking means provided inside the footing 2.

[0041] A horizontal duct 9 is further provided within the head 5, is open at the working surface 7 and runs along all or part of the width of the head 5; known pumping means, comprised within the spreader, inject into said duct the coating that must be deposited on the tape of backing medium 8 during operation.

[0042] Advantageously, the width of the duct 9 can match with very close approximation the width of said tape of backing medium 8 and can be optionally slightly larger, in order to ensure a minimum safety margin regarding the deposition of the coating on the entire surface of the backing medium.

[0043] A second embodiment of the spreader 101 according to the invention provides for the presence, inside the footing 102, of one or more second magnets 110, which are preferably driven electrically and are arranged approximately parallel to the tape of backing medium 108 and side by side; said one or more second magnets are advantageously mutually equidistant, and each one has a first upper end 111 arranged proximate to the lower end face 104 of the first seat 103.

[0044] The one or more second magnets 110 are therefore mutually spaced by a chosen extent, which is constant or variable along the width of the footing 102, so as to be distributed along all or part of its width, uniformly or concentrated in chosen regions.

[0045] A third embodiment of the spreader 201, according to the invention, comprises at least one third magnet 211, which is formally also termed lower magnet, and at least one fourth lower magnet 212, both of which are preferably of the electrically-driven type; such magnets are respectively coupled to the mutually opposite walls, termed side walls by convention, of the footing 202, in a region that is adjacent to the head 205 and lies above it, and are preferably arranged approximately parallel to the tape of backing medium 208.

[0046] There is also a supporting element 214, which is for example approximately as wide as the footing 202 and supports, at its lateral ends, respectively at least one fifth magnet 215, termed upper magnet, and at least one fourth magnet 216, termed upper magnet, both of which are preferably of the electrically-driven type.

[0047] The at least one fifth magnet 215 and at least one sixth magnet 216 are preferably arranged approximately parallel to the tape of backing medium 208 and are respectively aligned with the at least one third magnet 212 and said at least one fourth magnet 213 and are spaced from them.

[0048] Accordingly, a first gap 217 between said at least one third magnet 212 and said at least one fifth magnet 215 and a second gap 218 between said at least one fourth magnet 213 and at least one sixth magnet 216 are provided.

[0049] The first and second gaps accommodate the opposite lateral ends 219 of a supporting bar 220, which is thinner than the height of the first and second gaps, so as to be able to move vertically within such gaps, and is made, at least at its opposite lateral ends 219, of a magnetic material.

[0050] Bearing in mind again that the arrangements of the components are correlated to the chosen arrangement of the invention in the accompanying figures, it is noted that one or more for example cylindrical or parallelepipedal pins 221 are associated in a lower region

with the supporting bar 220, are vertically parallel to each other, and can slide within one or more complementarily shaped second vertical seats 222 provided inside the footing 202 at the head 205 and above it.

[0051] The one or more second seats 222 are open, at one of their lower ends 223, at the upper wall 224 of the first seat 203, and each one can optionally accommodate, proximate to the lower end 223, a shock-absorbing element 225 that rests directly on the upper end face 226 of the head 205.

[0052] Conveniently, the one or more pins 221 are approximately as long as, or slightly longer than, the upper region of the second seats 222 that is not occupied by the shock-absorbing elements, so that when the supporting bar 220 adheres to the third and fourth lower magnets 212 and 213, the pins compress in an upper region the shock-absorbing elements against the head 205, locking it in its position.

[0053] The supporting bar can thus pass from a first position, also termed locking position, in which it rests on the at least one third lower magnet and on the at least one fourth lower magnet, to a second position, also termed open position, in which it adheres in a lower region to the at least one fifth and sixth upper magnets.

[0054] A variation of the spreader 301 according to the invention, which can be applied to each one of its embodiments described above, comprises two or more pins 326, which are inserted vertically within the head 305 and are accommodated, at one of their lower ends 327, in complementarily shaped vertical seats 328, which are formed inside the footing 302 and are open in an upper region at the lower end face 304 of the first seat 303.

[0055] Such two or more pins 326 are arranged side by side and conveniently at a certain mutual distance, so as to ensure a coupling against any unwanted rotations of the head 305 with respect to the footing 302, particularly if the first seat 303 is not shaped complementarily to the head 305.

[0056] The operation of the spreader according to the invention provides for the insertion, with the first seat, of a spreading head provided with a duct that is wide enough for the dimensions of the tape of backing medium that is to slide in contact with its working surface.

[0057] Once the head has been positioned, it is possible to supply power to the one or more magnets by means of the electronic control and adjustment device, so that they apply to the head an attractive force that is capable of coupling it rigidly to the footing.

[0058] During the activation and deactivation of the magnets, the shielding means automatically isolate the sensors that are provided inside the spreader, since the signals emitted by said sensors can be altered by the magnetic fields generated during these transitions: said sensors are then reactivated automatically once they have reached stable conditions.

[0059] If the width of the tape of backing medium processed by the spreader changes, it is possible to replace

rapidly the spreading head with one that has a duct of adequate width by simply deactivating the magnets that couple it to the footing.

[0060] This operation is extremely simple and quick to perform, since it does not entail disassembling any component and therefore does not require the intervention of specialized labor, requires very short apparatus downtimes, and allows to reduce operating and labor costs.

[0061] Further, this replacement can occur also if different coatings are alternately deposited on the same spreader, eliminating the danger of contamination arising from particles of coating that stagnate within the head and are released uncontrollably.

[0062] The absence of liquids that are not part of the coating eliminates the possibility of contaminating said coating; moreover, the safety and reliability of the electromagnetic locking means forces minimal maintenance, ensuring a high productivity of the spreader.

[0063] Since the magnets are accommodated inside the footing in the first and second embodiments presented here, the spreader according to the invention is compact and therefore can be inserted easily within any apparatus.

[0064] Operation in the case of the third embodiment described above entails that if the head must be coupled to the footing, the lower magnets are activated, forcing, by means of the supporting bar, the pins supported by said bar against the upper wall of the spreading head, which is thus pushed toward the lower end face of the first seat.

[0065] In order to replace the spreading head, it is possible to actuate the upper magnets, which by lifting the supporting bar free said head from the action of the pins, allowing its easy extraction and the insertion of a new head that is suitable for the process to be performed on the spreader.

[0066] Further, the third embodiment can be provided easily even starting from known spreaders, allowing easy updating of existing apparatuses.

[0067] It has thus been found that the invention has achieved the intended aim and objects, a spreader for depositing adhesives or polymeric materials in a liquid dispersion on a tape of backing medium having been provided which is capable of ensuring its easy, quick and effective optimization according to the type of coating that is deposited and according to the dimensions of the backing medium.

[0068] Another object achieved by the invention is to ensure stable and safe fixing of the head to the footing of the spreader.

[0069] Another object that is achieved is to provide a spreader that is compact and highly reliable in operation and has low operating costs.

[0070] Another object achieved by the invention is to allow its operation and optimization without the presence of specialized personnel, thus reducing labor costs.

[0071] The materials used, as well as the dimensions that constitute the individual components of the invention, may of course be more pertinent according to specific requirements.

[0072] The various means for performing certain different functions need not certainly coexist only in the illustrated embodiment but can be present per se in many embodiments, including ones that are not illustrated.

[0073] The characteristics indicated as being advantageous, convenient or the like can also be omitted or be replaced by equivalents.

[0074] The disclosures in Italian Patent Application No. TV2004A000020, from which this application claims priority, are incorporated herein by reference.

[0075] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A spreader particularly for depositing adhesives and/or polymeric materials in a liquid dispersion, comprising a head that is detachably associable with a footing, **characterized in that** it comprises electromechanical means for detachably locking said head to said footing.
2. The spreader according to claim 1, **characterized in that** said footing is approximately shaped like a parallelepiped and has a first seat, which is arranged horizontally along part or all of the width of said footing and is open onto at least one front face thereof, for partially accommodating said first head.
3. The spreader according to claims 1 and 2, **characterized in that** said electromechanical means for locking said spreading head are inserted within said footing proximate to a lower end face of said first seat.
4. The spreader according to claims 1 and 3, **characterized in that** said head is substantially shaped like a parallelepiped and mates with at least one portion said lower end face of said first seat and runs horizontally along all or part of said first seat.
5. The spreader according to claims 1 and 4, **characterized in that** part of said head matches the shape of said first seat and is slightly smaller than said first seat in order to allow its insertion therein.
6. The spreader according to claims 1 and 5, **characterized in that**

terized in that said head has, at the opening of said first seat, a working surface that protrudes externally from said front face of said footing and in contact with which a tape of backing medium can slide.

7. The spreader according to claims 1 and 6, **characterized in that** said head is at least partially made of magnetic material and is sensitive to the action of the magnetic field that can be generated by said electromagnetic locking means.

8. The spreader according to claims 1 and 7, **characterized in that** a horizontal duct is formed inside said head, is open at said working surface, and runs along part or all of the width of said head, for the injection of adhesives and/or polymeric materials in a liquid dispersion.

9. The spreader according to claims 1 and 8, **characterized in that** the width of said duct is approximately equal to the width of said layer of backing medium, or larger than said width by a chosen minimum value.

10. The spreader according to claims 1 and 9, **characterized in that** it comprises means for shielding any sensors that are present inside said spreader from the magnetic fields that can be generated by said electromagnetic locking means, particularly during the transitions for the activation and deactivation of said means.

11. The spreader according to claims 1 and 10, **characterized in that** said shielding means consist of an electronic circuit for automatic deactivation and reactivation of said sensors during the transitions of the operation of said electromagnetic locking means.

12. The spreader according to claims 1 and 11, **characterized in that** said electromagnetic means are constituted by at least one first magnet, which is provided by means of a coil that is made of electrically conducting material, is electrically driven, runs substantially horizontally along all or part of the width of said footing, and is arranged inside said footing, proximate to said lower end face of said first seat.

13. The spreader according to claims 1 and 11, **characterized in that** said at least one first magnet is powered by an electric power source, the intensity of the current that flows therein being adjustable by means of an electronic control and adjustment device that is interposed between said at least one first magnet and said electrical mains.

14. The spreader according to claims 1 and 11, **char-**

acterized in that said electromagnetic locking means are constituted by one or more second magnets, which are arranged inside said footing, are approximately parallel to said tape of backing medium and are arranged mutually side by side.

15. The spreader according to claims 1 and 14, **characterized in that** said one or more second magnets each have a first upper end arranged proximate to said lower end face of said first seat.

16. The spreader according to claims 1 and 15, **characterized in that** said one or more second magnets are mutually spaced by a chosen pitch, which is constant or variable along the width of said footing.

17. The spreader according to claims 1 and 11, **characterized in that** said electromagnetic locking means comprise at least one third magnet and at least one fourth magnet, which are rigidly coupled respectively to the mutually opposite walls of said footing, in a region that is adjacent to said head and lies above it, and are arranged approximately parallel to said tape of backing medium.

18. The spreader according to claims 1 and 17, **characterized in that** it comprises a supporting element that is approximately as wide as said footing and supports, at its lateral ends, respectively at least one fifth magnet and at least one fourth magnet, both of which are of the electrically-driven type.

19. The spreader according to claims 1 and 18, **characterized in that** said at least one fifth magnet and said at least one sixth magnet are arranged approximately parallel to said tape of backing medium and are respectively aligned with said at least one third magnet and at least one fourth magnet and are spaced from them, so as to form a first gap between said at least one third magnet and said at least one fifth magnet and a second gap between said at least one fourth magnet and said at least one sixth magnet.

20. The spreader according to claims 1 and 19, **characterized in that** the opposite lateral ends of a supporting bar are accommodated within said first and second gaps, said supporting bar being thinner than the height of said first and second gaps, being able to move vertically within them, and being made, at least at said opposite lateral ends thereof, of a magnetic material.

21. The spreader according to claims 1 and 20, **characterized in that** one or more pins are associated with said supporting bar, below it, said pins being preferably cylindrical or parallelepipedal and being arranged vertically parallel to each other and so that

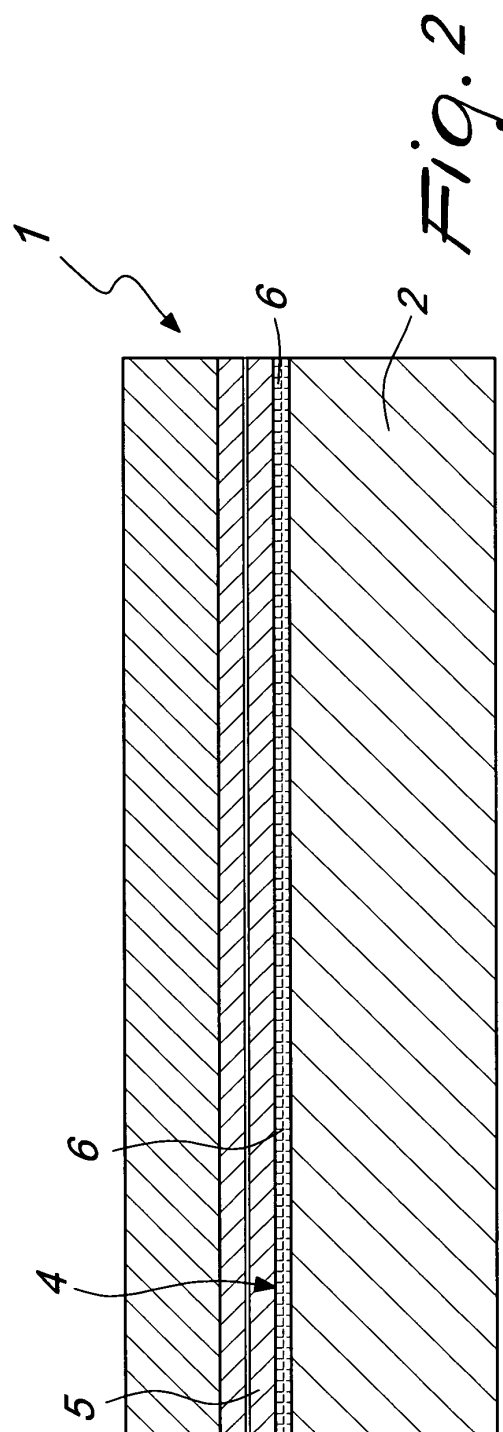
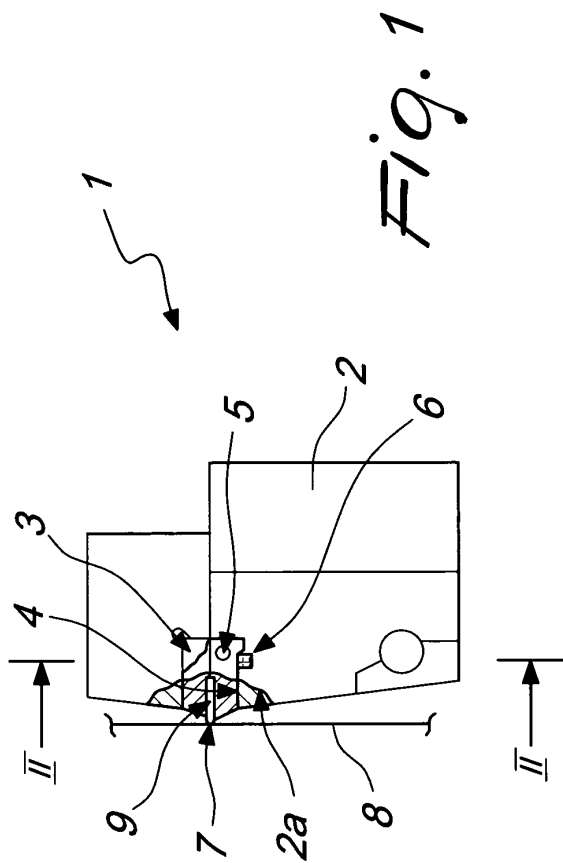
they can slide within one or more complementarily shaped second vertical seats formed inside said footing at said head and above it.

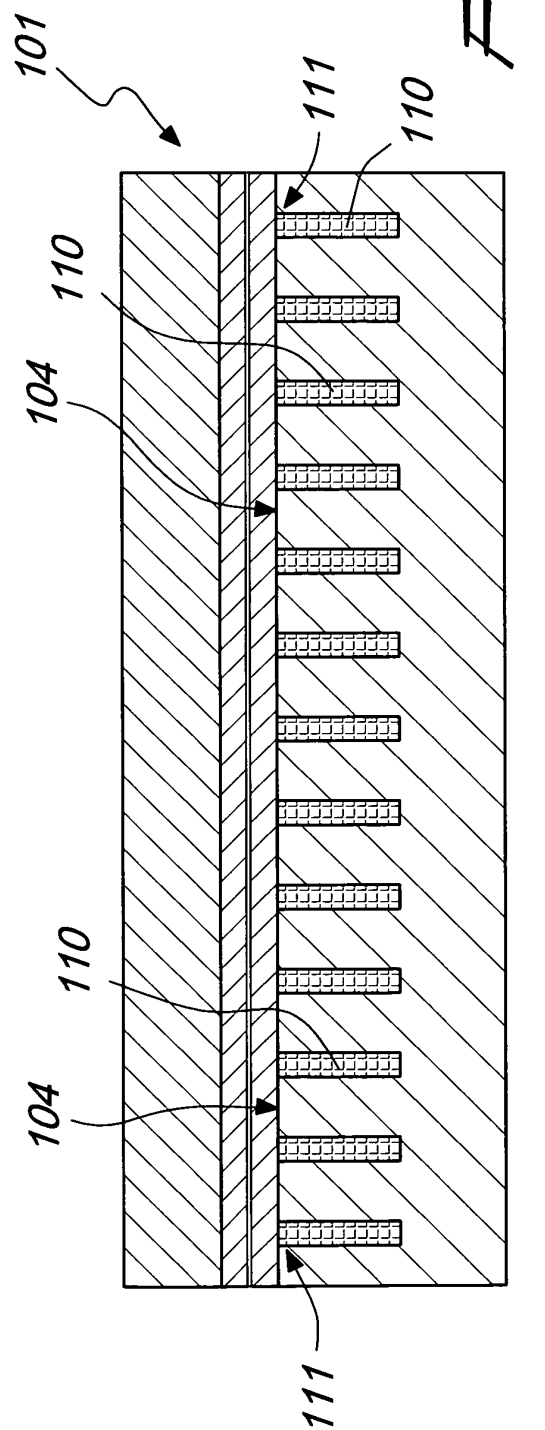
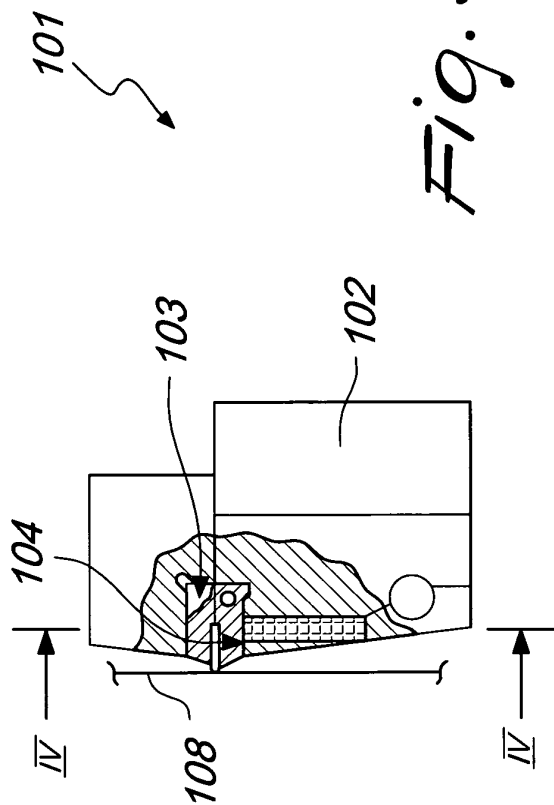
22. The spreader according to claims 1 and 21, **characterized in that** said one or more second seats are open, at one of their lower ends, at an upper wall of said first seat, and each one accommodates, proximate to said lower end, a shock-absorbing element that rests directly on an upper end face of said head. 5 10
23. The spreader according to claims 1 and 22, **characterized in that** said one or more pins have a length that is at least equal to the length of the upper region of said second seats that is not occupied by said shock-absorbing elements. 15
24. The spreader according to claims 1 and 23, **characterized in that** said supporting bar can pass from a first locking position, in which it rests on said at least one third magnet and on said at least one fourth magnet, to a second open position, in which it adheres in a lower region to said at least one fifth magnet and to said at least one sixth magnet. 20 25
25. The spreader according to one or more of the preceding claims, **characterized in that** it comprises two or more pins, which are inserted vertically within said head and are accommodated, at a lower end, in complementarily shaped vertical seats, which are formed inside said footing and are open in an upper region at said lower end face of said first seat. 30
26. The spreader according to claims 1 and 25, **characterized in that** said two or more pins are arranged side by side and conveniently arranged at a certain mutual distance, so as to constitute a retaining element against any unwanted rotations of said head with respect to said footing. 35 40

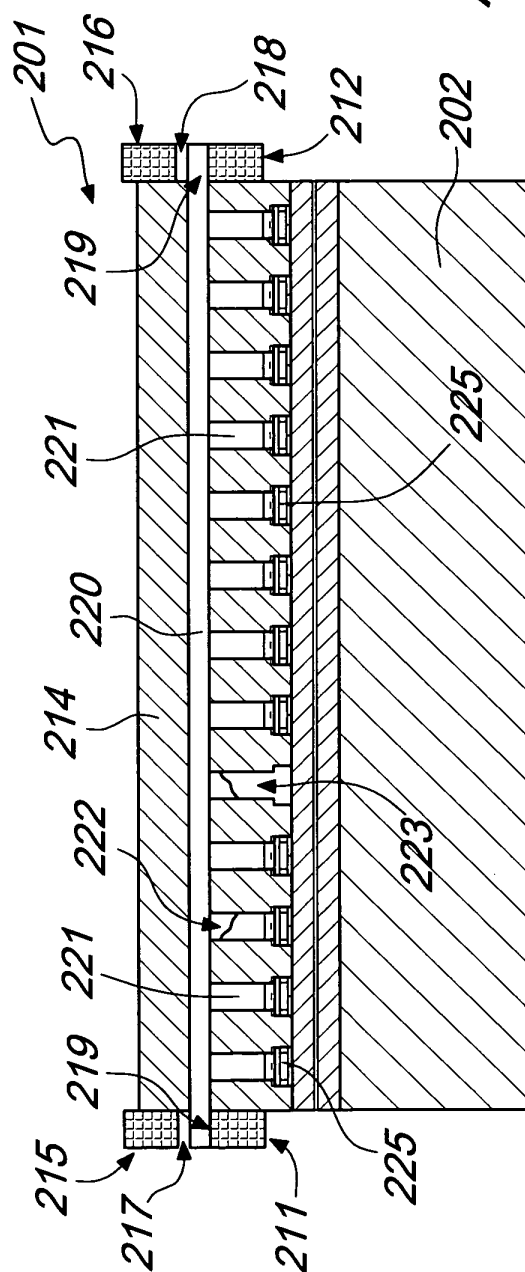
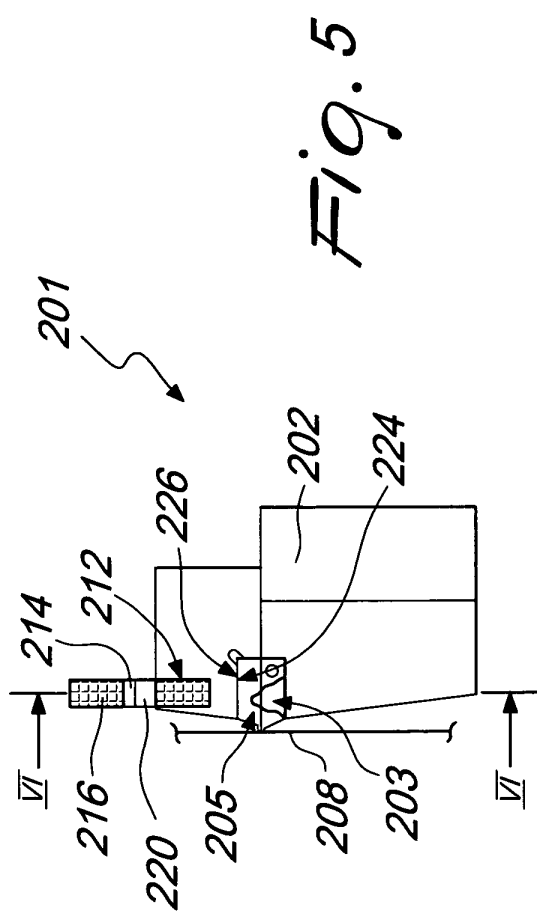
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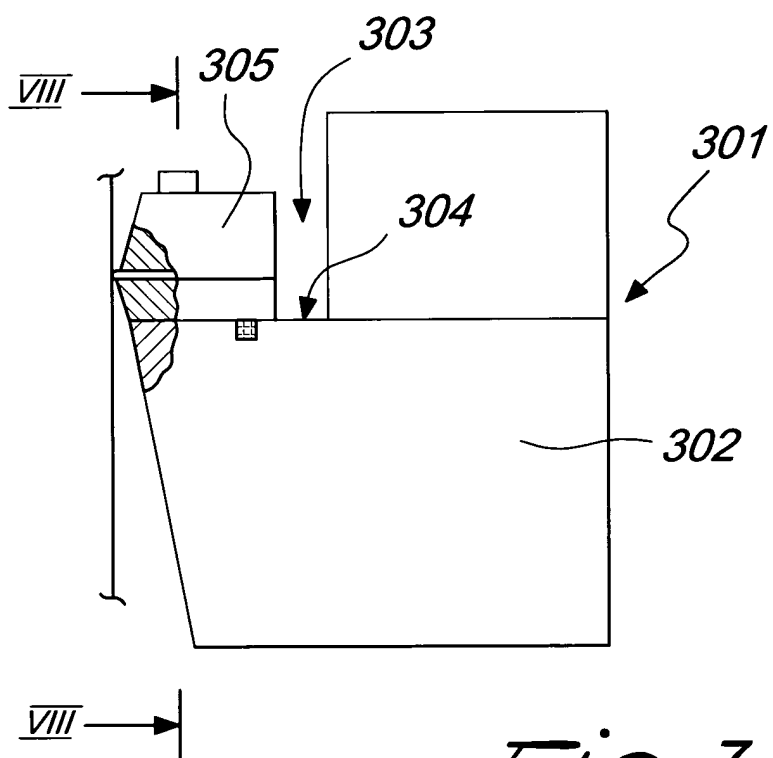


Fig. 7

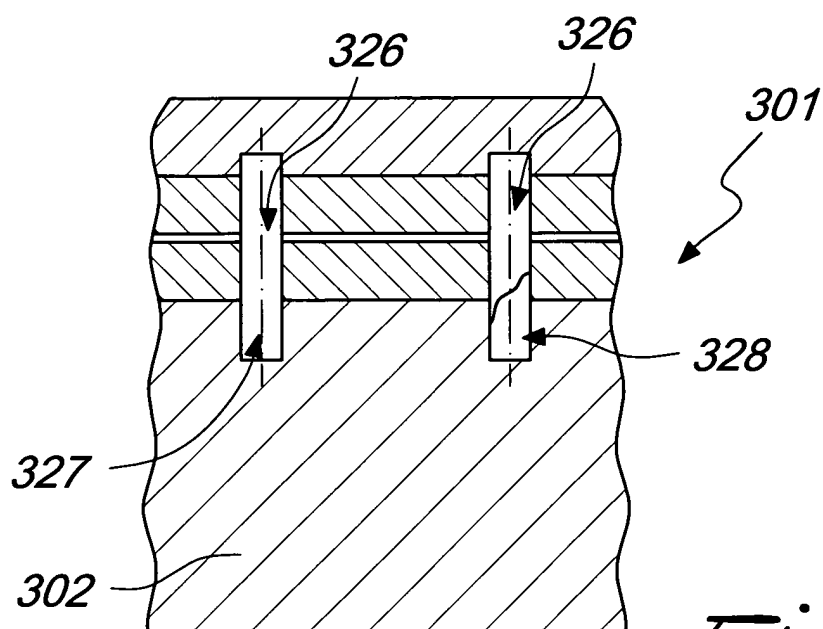


Fig. 8