Device for clasping profiled bodies particularly bottle-like containers, which device comprises a holding element for receiving an extension of the profiled body, for example the neck of the bottle, the holding element is shaped as a closed form having a seat in the middle and having teeth formed along the inner side and at least two holding elements are coupled to each other with a joining element. On the side of the holding element (4) an opening element (8) is formed. The invention further relates to a machine for attaching of a device onto bottles which device is suitable for clasping the bottles, the machine comprises a feeder and a press die rotatable around a shaft, the bottles are directed beneath the press die preferably by means of a conveyor wherein the press die (11) comprises pressing elements (12) radially positioned along the supercicies of a shaft or of a cylinder.
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DEVICE FOR CLASPING OF PROFILED BODIES AND MACHINE FOR ATTACHING OF THAT

The invention relates to a device for clasping profiled bodies particularly bottle-like containers which device comprises a holding element for receiving the extension of the profiled body, for example the neck of the bottle. The holding element is shaped as a closed form having a seating in the middle and having teeth formed along the inner side and at least two holding elements are coupled to each other with a joining element. The invention further relates to a machine for attaching the device to profiled bodies in particular to bottles. The machine is provided with a feeder for feeding the device and a press die rotatable around a shaft. The bottles are directed beneath the press die preferably by a conveyor.

For the sake of simplicity in the description of the invention bottles are kept in view and the present solution will be described according to this. Of course the term bottles do not refer only to conventional bottles made of glass, but bottles or containers made of plastic as well.

Means for holding or keeping number of bottles together has already been known, wherein a single body includes number of seats and a handle is attached to this body or the handle is formed of the material of the body. The seats as well as the bridging to connect these seats usually have lattice or lightened walls. In spite of this they are rather heavy, large-sized and expensive, though they are usually made of cheap material.

Another known solution proposes holding means for storing or transporting a bottle or bottles in a suspended way. In case of individual bottles it usually means an element provided
with a handle encircling the neck of the bottle partially or wholly.

EP 0069334 describes finger grip for a bottle-like container to facilitate handling. The finger grip consists of a grip part and a ring part. The ring part has several elastic blocking portions on the inside of the ring. After mounting the finger grip, the blocking portions prevent the finger grip from slipping back over the bead of the container neck. This solution has several problems. For example mechanization is complicated. Further, transporting, storing or moving of the containers inside the repository is still difficult. This solution can be advantageous in case of large sized bottles, when moving of the bottles is required one by one. As far as the finger grip is not constructed to be able to turn away, transporting of the bottles is complicated, though emptying of them is easier. If the finger grip can be turned, then transporting becomes more convenient, but production of the finger grip is more expensive and more elaborate. When using this finger grip clasping of several bottles can not be effectuated since after mounting the grip on the bottle the grip is irremovable or it can be removed only after opening the bottle.

Patent application WO 9601068 describes a detachable bottle-holder with a forked bottle-holding element to which a handle is attached. The bottle-holding element can be pushed on to the neck of the bottle and it enables a bottle to be handled more simply. This solution makes pouring easier and may simplify transporting, but does not ensure clasping of several bottles to each other.

Hungarian utility model titled "Device for Clasping of Profiled Bodies, Especially of Bottles" registration number 1236 describes a device suitable for clasping, transporting and storing of several bottles. This device has horse-shoe
shaped head portions provided with seats to receive the neck of the profiled body (e.g. bottle). The head portions are coupled by means of one or more bridges to which a handle is connected. A disadvantage of this solution is that during transport the bottles may slip out sideways. To prevent the bottles from slipping out it is preferable to use a suitable material for fixing the bottles together. A further disadvantage of this solution is that mechanization of the mounting of the device is rather complicated, while mounting manually is labour-intensive therefore expensive.

Hungarian utility model titled "Bottle Holder" registration number 1261 describes a solution similar to the previous one with the exception of making the horse-shoe shaped seats into closed rings. In this case teeth are formed along the inner edge of the belt portion inside the seat. This teething makes positioning of the bottle neck into the ring possible since the inner edge of the belt portion is able to bend along the teeth. However, bending is possible in both direction, therefore the bottle can not be lifted up.

One object of the present invention is to provide a device which is suitable for clasping of profiled bodies particularly of bottles, which is suitable for keeping the bottles safely together, and which makes transportation of them easier and safer and which can be attached to the bottles in a simple manner.

Another object of the present invention is to provide a machine suitable for effecting simple attachment of the device co-operating with the bottle-charger and can be connected to the bottle-charger without the need of any modification of it.

The present invention stems from a realization that when making the holding element as a closed ring on the inner side
of which a collar consisting of teeth is formed, and the inner diameter of the collar is slightly smaller than the rim of the bottle, then flexibility of the teeth enables the closed ring to be pushed under the rim even after filling the bottles and closing them with a cap, further, an opening element positioned on the holding element assures taking out of the bottles during use. In addition, the inventors have realized that when using a cylindrical press die on the surface of which pressing elements are deposited in radial direction, and the distance between the subsequent pressing elements is determined according to the distance between the subsequent bottles directed beneath the press die, further when synchronizing the peripheral speed of the press die to the speed of the bottles directed beneath the press die, then attaching of the device to the bottles can be mechanized without the need of any modification of the bottle-charger.

Accordingly the present invention provides a device for clasping of profiled bodies particularly of bottles, which device comprises a holding element formed as a closed ring for receiving the extension of the profiled body, for example the neck of the bottle having a rim. The holding element is provided with teething along its inner side. At least two holding elements are coupled to each other with a joining element. The distance between the holding elements is determined correspondingly to at least the largest cross section of the bottles, and on the side of the holding element an opening element is formed.

Advantageously the end parts of the teeth are attenuated gradually.

In another aspect the present invention provides a device for clasping profiled bodies particularly bottle-like containers, which device comprises a holding element for receiving the extension of the profiled body, for example the neck of the
bottle. The holding element is shaped as a closed form having a seat in the middle and having teeth formed along the inner side and at least two holding elements are coupled to each other with a joining element. The teeth are formed as laminas and at one end they are fixed to the inner superficies of the holding element in such a way that the plane of the teeth and the base of the holding element include an acute angle. Further, on the side of the holding element an opening element is formed.

Advantageously the smallest diameter of the seat is smaller then the diameter of the rim on the bottle’s neck or of the cap.

In one embodiment a handle is fixed to the joining element and it may be provided with inscriptions.

In a third aspect the present invention provides a machine for attaching of the clasping device onto the bottles. The machine is provided with a feeder and a press die rotatable around a shaft. The bottles are directed beneath the press die preferably by means of a conveyor. The press die consists of pressing elements radially positioned along the superficies of a shaft or of a cylinder. The distance between the subsequent pressing elements is determined by the distance between the subsequent bottles directed beneath the press die. The peripheral speed of the press die is synchronized to the speed of the bottles directed beneath the press die.

The number of the press dies positioned on the common shaft is preferably equal to the number of the contiguous bottles directed on the conveyor. In an advantageous embodiment in case of using more than one press die a spacer is installed in between the press dies and the surface of the pressing elements or part of it is reinforced with wear-resisting material.
In a preferred embodiment the devices are stored in a storage means from where they are forwarded to the feeder by means of a conveying belt.

The device according to the present invention will be described in more detail, by way of examples, with reference to the accompanying drawings, where:

Figure 1 shows the plan view of an example embodiment of the device according to the invention;

Figure 2 shows the side view section of the device according to figure 1;

Figure 3 shows the side view section of the opening element;

Figure 4 shows the side view section of the device according to figure 1 provided with a handle;

Figure 5 shows the plan view of another example embodiment of the device according to the invention adapted for receiving four bottles;

Figure 6 shows the plan view of a further example embodiment of the device according to the invention provided with a detachable handle and adapted for receiving four bottles;

Figure 7 shows the plan view of the device according to figure 1 when receiving one bottle;

Figure 8 shows the side view partial cross section of the device according to figure 1 when clasping two bottles;
Figures 9 and 10 show the plan view of further possible embodiments of the device according to the invention;

Figure 11 shows the plan view of a preferred embodiment of the machine according to the invention when applied to the bottle-charger;

Figure 12 shows the side view of the application of the device according to the invention using one type of press die;

Figure 13 shows a detail of the embodiment according to figure 12;

Figure 14 shows the plan view of another preferred embodiment of the machine according to the invention when applied to the bottle-charger;

Figure 15 shows the side view of a preferred embodiment of the feeder;

Figure 16 shows the plan view of a preferred embodiment of the feeder integral with a storage means;

Figure 17 shows the perspective view of the feeder integral with the storage means according to figure 16;

Figure 18 shows the side view of the application of the device according to the invention using another type of press die;

Figure 19 shows the plan view of an example embodiment of the device according to the invention;
Figure 20 shows the A-A section of a holding element of the device according to figure 19.

Figure 21 shows the B-B section of a portion of a holding element of the device according to figure 19.

Hereinafter the term bottle holder 25 will be used for the device according to the invention for the sake of simplicity. Two simple embodiments of the bottle holder 25 are shown in figures 1 and 19. As it can be seen from the side view section of figure 2, bottle holder 25 has a platelike profile which can be manufactured e.g. from plastic in a simple way using one of the well-known methods of molding. These example embodiments are made up of two holding elements coupled to each other by means of a joining element 5.

According to figure 1 on the inner side of holding elements a collar 7 consisting of teeth 6 is formed. These constitute seating 3 which fits onto neck 2 of bottle 1 under rim 18. The flexibility of teeth 6 makes it possible to seat 3 of the holding element 4 to be pushed under rim 18. In the embodiment of figure 19 teeth 6 are formed as laminas – for example having a brick-shaped body wherein the thickness of the body is insignificant in comparison with the measurements of the other two sides – and at one end they are fixed to the inner superficies of the holding element 4 in such a way that the plane of the teeth 6 and the base of the holding element 4 include an acute angle. These are shown in figures 20 and 21.

Removal of bottle 1 from bottle holder 25 is enabled by opening element 8 the section of which can be seen in figure 3. There are two possible ways of making the material weaker for enabling opening element 8 on the two holding elements of bottle holder 25 shown in figure 19 to be ripped. In one
case the superficies of the holding element 4 is attenuated from the inside at the edges of opening element 8, and in the other case from the outside. By ripping of opening element 8 opens up seat 3 of holding element 4 flexibility of which enables taking out bottle 1 from bottle holder 25. Joining element 5 can be provided with handle 9 as it is shown in figures 4 and 5.

Figure 5 also shows a plate-like bottle holder 25 but in this case joining element 5 is circular and it has four holding elements 4. In figure 5 two of the holding elements 4 are shown with bottles 1 inserted and two of the holding elements are shown without bottles 1. The diameter of the circular joining element 5 can be smaller than it is represented in figure 5, and it can be reduced to the distance smallest between holding elements 4.

Figure 6 shows bottle holder 25 according to figure 1 having joining element 5 and four holding elements 4, two of which is shown with bottles 1 inserted and two of which is shown without bottles 1. In this embodiment the bottle holder is provided with a pull-out handle 9 which is widely used for example with cartons of detergents. Of course, this type of handle is applicable in case of bottle holders constructed in any ways according to the invention to make moving of the bottles 1 easier.

In figure 7 bottle holder 25 of figure 1 is shown consisting of joining element 5 and two holding elements 4, wherein one of the holding elements 4 has a bottle 1 inserted and the other does not.

Figure 8 shows partial cross section of bottle holder 25 according to figure 1 having bottle 1 in both seats 3. In this figure it can be seen clearly in what way teeth 6 in seat 3 fit to rim 18 from underneath.

Figures 9 and 10 shows possible example embodiments of bottle
holder 25 according to figure 1 having more than two holding elements. 4. Bottle holder 25 can be used also for beer bottles, in this case holding element 4 is pushed under the cap of the beer bottle, and it can be used in the same way as in case of bottles 1 having a rim 18. These embodiments are not shown in figures as application of them is obvious from the teachings given in the foregoing. Of course holding element 4 can be formed not only with a circular cross section but also it's cross section can be of polygonal shape without departing the scope of the invention. From the foregoing it is obvious that any kind of protrusion formed or positioned on the neck of bottle 1 and being suitable for preventing slipping out of bottle 1 from bottle holder 25 is considered as rim 18. Rim 18 can be anything that provides a surface on the neck of bottle 1 which is suitable for blocking teeth 6 formed on bottle holder 25. For example flounced edge of beer bottle caps is considered as rim 18. It is clear that measurement of seat 3 must be adjusted to the relevant rim 18.

As a result of design of bottle holder 25 it can be snapped onto neck 2 of bottle 1 through rim 18. This design made it feasible to place the machine of figures 11 or 14 developed for attaching of bottle holder 25 onto the neck of bottle 1 over the bottle charger. In these figures part of the bottle charger where bottles 1 already filled and sealed with a cap leave the bottle charger on conveyor 17 (roller conveyor, belt conveyor, etc.) is also shown. The machine according to the invention basically consists of press die 11 and feeder 10.

One possible embodiment of feeder 10 can be seen in figure 15. According to figure 15 feeder 10 consists of controller 21, piston 22 pre-stretched by spring 23, and roller-track 24. Bottle holders 25 are positioned before piston 22 which
during operation continuously forwards them onto bottles 1 sealed with caps 26 and carried on roller-track 24. Bottles 1 are directed under roller-track 24 by means of conveyor 17. Piston 22 is actuated by controller 21. Actuation of controller 21 can be performed by means of any mechanical or electronic device already well known in practice, which is expediently synchronized to conveyor 17. Effectuation of this is obvious for those skilled in the art, therefore more detailed description of it is not necessary for realization of the machine according to the present invention. Feeder 10 can be integral with storage means 15 as it can be seen in figures 16 and 17. This unit can be coupled to machines shown in figures 11 and 14, but this is not represented in a separate drawing. According to figures 16 and 17 bottle holders 25 take up a suitable position before piston 22 as a result of force of gravity. Feeder 10 can be set up separately from storage means 15 as it can be seen in figures 11 and 14. For example, in figure 11 storage means 15 is a shaking apparatus from which bottle holders 25 are shaken onto conveying belt 16, and this belt forwards them into feeder 10. In figure 14 there is no conveying belt 16 coupled between storage means 15 and feeder 10. These parts of the machine according to the invention are not of vital importance, those skilled in the art can realize them optionally.

Two possible embodiments of press die 11 are shown in figures 12 and 18. An enlarged portion of press die 11 according to figure 12 is shown in figure 13. Press die 11 can be for example either a solid cylinder mounted on shaft 19 (figure 12) or a lightened body of revolution mounted on shaft 19 (figure 18), on the circumference of which pressing elements 12 are positioned equidistant from each other. In one possible embodiment the pressing element 12 has a tube-like
profile the inner diameter of which is larger than rim 18 on the neck 2 of bottle 1, but smaller than the outer diameter of holding element 4 of bottle holder 25.

In another possible embodiment pressing element 12 can be formed as a solid prism as it is shown in figure 18, wherein the length of side of the prism is equal to or smaller than the length of the joining element 5 of bottle holder 25 clasping two bottles 1 following each other.

In both cases, pressing elements 12 are positioned from each other in a distance so that they would fit onto or in between successive bottles 1 for pressing of bottle holder 25 properly. It can be seen clearly in figures 12, 13 and 18. The measured distance between points of intersection where axes of symmetry of successive pressing elements 12 intersect the circumference of the circle that can be drawn around press die 11 is equal to distance L between successive bottles 1. To provide a long-wearing pressing element 12 it is preferable to coat at least the surface of pressing element that meets bottle holder 25 with some wear-resisting material. Press die 11 advantageously rotates on shaft 19 which is mounted in shaft hanger 20 by means of bearing. For sake of proper operation the peripheral speed of the press die 11 must be synchronized to the speed of bottles 1 forwarded on conveyor 17. There are several known methods for performing this synchronization for example one possible method is when press die 11 mounted on shaft 19 is rotated by means of an electric motor 27 coupled to shaft 19. The speed of electric motor 27 is controlled electronically. In this case control electronics 28 is preferably coupled to an optical sensor 29 which senses bottle 1 passing by and regulates speed of electric motor 27 according to this. At the same time control electronics 28 can also perform actuation of controller 21, for example when controller 21 at
both ends is coupled to an electromechanical intervening unit, for example to a pull-in magnet or to an electrically controlled pneumatic or hydraulic device, and intervening unit 30 is coupled to control electronics 28. Realization of this can not be a problem for those skilled in the art.

During the bottling process bottles 1 are usually moved in several columns. The machine according to the present invention is shown with respect to bottles forwarded in six parallel columns in the accompanying drawings. Of course the number of columns is optional. In case of more than one column a spacer 13 is positioned in between individual press dies 11. This kind of disposal can be advantageous in terms of easy handling and also in terms of saving of materials. Now attachment of bottle holder 25 by using the machine according to the invention is clear from the foregoing. By means of conveyor 17, the bottles 1 already filled and sealed are passed under roller-tracks 24 having bottle holders placed on them in due position (in longitudinal direction). As a result of operation of controller 21 bottle holders 25 slide onto caps 26 of two bottles 1 following each other. When they pass beneath press die 11 bottle holder 25 is pushed under rim 18 (figures 12, 13 and 18). Proper meeting of press die 11 and bottle 1 is ensured by means of electric motor 27, sensor 29 and intervening unit 30 each coupled to control electronics 28.

Bottle holder 25 is suitable for different advertisements or brand images to be placed on it thereby making packaging more aesthetic and making product sell well.

A device according to the invention can be used for keeping bodies of revolution together in groups during moving and/or during transport. The device is particularly suitable for keeping bottles together in groups during moving and/or during transport. The bottles clasped with the holder
according to the invention can make offering of goods more attractive in shops, because bottles clasped in this way can be placed on a stand on which bottles hang. This kind of storage makes moving of the bottles easier when the stand is provided with wheels. The holder according to the invention is durable as it steadily endures intensive moving, twisting, swinging and swaying without bottles falling out of the holder or without the holder or the opening element getting damaged, as opposed to known devices. It can be manufactured of plastic at low cost, demands small space and it is light. As opposed to any known devices, the holder according to the invention has the special advantage that mounting of the holder on bodies of revolution can be mechanized. Mounting of the device onto bodies can be performed simply with the machine according to the invention and the machine can be installed in the manufacturing process without having influence on that. Holder according to the invention prevent bodies from accidental falling/slipping out of the holder due to it’s design.
Claims

1. A device for clasping of profiled bodies particularly of bottles, which device comprises a holding element formed as a closed ring for receiving an extension of the profiled body, for example the neck of the bottle having a rim, and the holding element is provided with teething along its inner side wherein at least two holding elements (4) are coupled to each other with a joining element (5), the distance between the holding elements (4) is determined correspondingly to at least the largest cross section of the bottles (1), and on the side of the holding element (4) an opening element (8) is formed.

2. A device according to claim 1 wherein the end parts of the teeth (6) are attenuated gradually.

3. A device for clasping profiled bodies particularly bottle-like containers, which device comprises a holding element for receiving an extension of the profiled body, for example the neck of the bottle, the holding element is shaped as a closed form having a seat in the middle and having teeth formed along the inner side and at least two holding elements are coupled to each other with a joining element wherein the teeth (6) are formed as laminas and at one end they are fixed to the inner superficialies of the holding element (4) in such a way that the plane of the teeth (6) and the base of the holding element (4) include an acute angle, and on the side of the holding element (4) an opening element (8) is formed.

4. A device according to any of the claims 1-3 wherein the smallest diameter of the seat (3) is smaller then the diameter of the rim (18) or of the cap (26) on the bottle’s (1) neck (2).

5. A device according to any of the claims 1-4 wherein a handle (9) is fixed to the joining element (5).

6. A device according to any of the claims 1-5 wherein the
handle (9) is provided with inscriptions.

7. A machine for attaching of a device onto bottles which device is suitable for clasping the bottles, the machine comprises a feeder and a press die rotatable around a shaft, the bottles are directed beneath the press die preferably by means of a conveyor wherein the press die (11) comprises pressing elements (12) radially positioned along the supercicies of a shaft or of a cylinder, the distance between the subsequent pressing elements (12) is determined by the distance between the successive bottles (1) directed beneath the press die (11) and the peripheral speed of the press die (11) is adjusted to the speed of the bottles (1) directed beneath the press die (11).

8. A machine according to claim 7 wherein several press dies are positioned on a common shaft.

9. A machine according to claims 7 or 8 wherein in case of application of more than one press die a spacer (13) is installed in between the press dies (11).

10. A machine according to any of the claims 7-9 wherein the surface of the pressing elements (12) or part of it is reinforced with wear-resisting material (14).

11. A machine according to any of the claims 7-10 wherein the devices are stored in a storage means (15) from where they are forwarded to the feeder (10) by means of a conveying belt (16).