By means of said dripper, the robotic arm, instead of waiting for the blood product bottles to finish emptying, leaves the bottles to drain on said dripper once initial emptying of the containers is complete, and in this way, the arm can then fetch the next batch of bottles while the blood product containers finish emptying. Before the robot carries out the first bottle emptying operation, the dripper drops said bottles, now completely empty, into the funnel for supplying the container crusher and returns to the holding position to wait for the robot to deposit the bottles onto the corresponding support rods such that said bottles finish emptying.

Consequently, an aspect of the present invention discloses an automated container-emptying device for emptying blood product equipped with means for collecting and gravity-emptying containers and comprising a product collection zone as well as a dripper equipped with at least one element for supporting upside down containers; said dripper additionally having two operating positions: a first for holding the containers to allow the product to drip onto the product collection zone and a second for ejecting said containers, characterized in that in the holding position, the at least one support element is pointing upwards from a horizontal shaft of the dripper.

One advantage of the present invention is that integrating a dripper into an automated device for emptying blood product containers, which dripper operates in conjunction with the remaining elements that make up said automated container-emptying device, greatly increases the productivity of said device. In addition, said dripper is designed and actuated so as to allow easy cleaning and decontamination thereof. Owing to the high level of asepsis required by the product to be extracted, this is especially important.

Preferably, the present automated container-emptying device is an automated device for emptying blood product. More advantageously, said blood product is frozen. Preferably, said containers are bottles.

In one embodiment of the invention, the dripper is formed by a longitudinal shaft which comprises at least one support element. Preferably, the at least one support element is a rod. Advantageously, the plurality of support rods are on the same plane perpendicular to the longitudinal shaft. In the holding position of the dripper, at least one support element is pointing upwards from a horizontal shaft of the dripper, such that the at least one support element can hold at least one blood product bottle upside down.

CLAIMS

1. Automated container-emptying device for emptying blood product equipped with means for collecting and gravity-emptying containers and comprising a product collection zone, and further comprising a dripper equipped with at least one element for supporting upside down containers; said dripper also having two operating positions: a first for holding the containers to allow the product to drip onto the product collection zone and a second for ejecting said containers, characterized in that in the holding position, the at least one support element is pointing upwards from a horizontal shaft of the dripper.

2. Device according to claim 1, characterised in that the at least one support element is a rod.

3. Device according to any one of the preceding claims, characterised in that the dripper moves from the holding position to the ejecting position by rotating.

4. Device according to any one of the preceding claims, characterised in that a rotary module actuates the dripper.

5. Device according to claim 4, characterised in that said rotary module comprises pneumatic actuation means.

6. Device according to any one of the preceding claims, characterised in that the ejecting position of the dripper is such that the used containers are caused to fall, by the force of gravity, into the funnel for collecting used containers.

7. Device according to any one of the preceding claims, characterised in that the means for collecting and gravity-emptying containers comprise a robotic arm.

8. Device according to claim 1, characterised in that said device is an automated device for emptying frozen product.

9. Device according to any one of the preceding claims, characterised in that said containers are bottles.

10. Device according to any one of the preceding claims, characterised in that said device comprises sensors for detecting the position of the dripper.

11. Device according to any one of the preceding claims, characterised in that it comprises means for coordinating the dripper with the means for collecting and gravity-emptying containers.

12. Device according to claim 11, characterised in that the coordination means are such that,

when the means for collecting and gravity-emptying containers are in a position for collecting a subsequent plurality of containers to be emptied, the dripper is in the position for holding containers upside down, allowing the product to drip onto the collection zone;

when the means for collecting and gravity-emptying containers are in the position for inverting containers in the product collection zone, the dripper is in the container-ejecting position;

when the means for collecting and gravity-emptying containers have finished inverting containers, the dripper returns to the container-holding position so that the collecting and gravity-emptying means can leave said containers to drain on the respective support elements thereof.

13. Device according to any one of the preceding claims, characterised in that all the metal components that may come into contact with the blood product are made of stainless steel suitable for medical use.