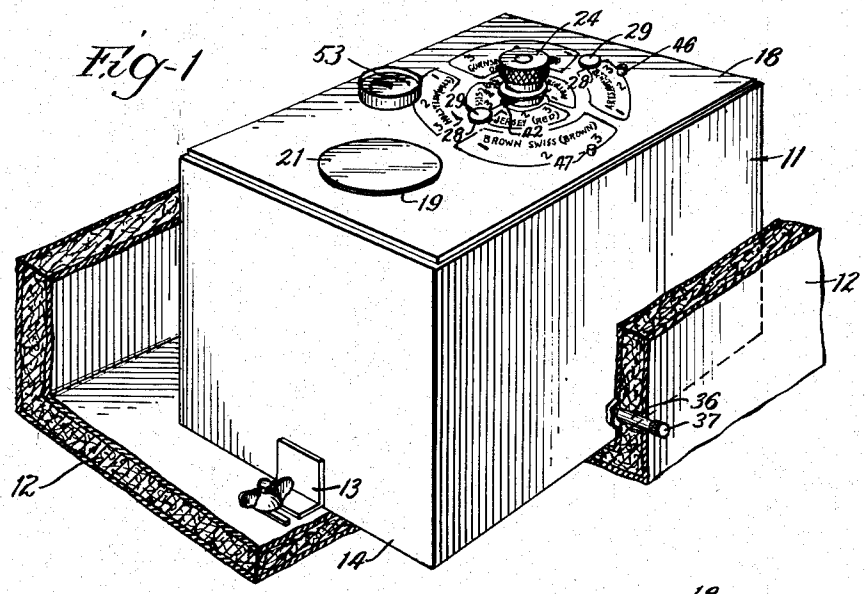
Nov. 30, 1954 M. M. HORNISH 2,695,729

DISPENSING REFRIGERATOR FOR ARTIFICIAL INSEMINATION

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Fig-1



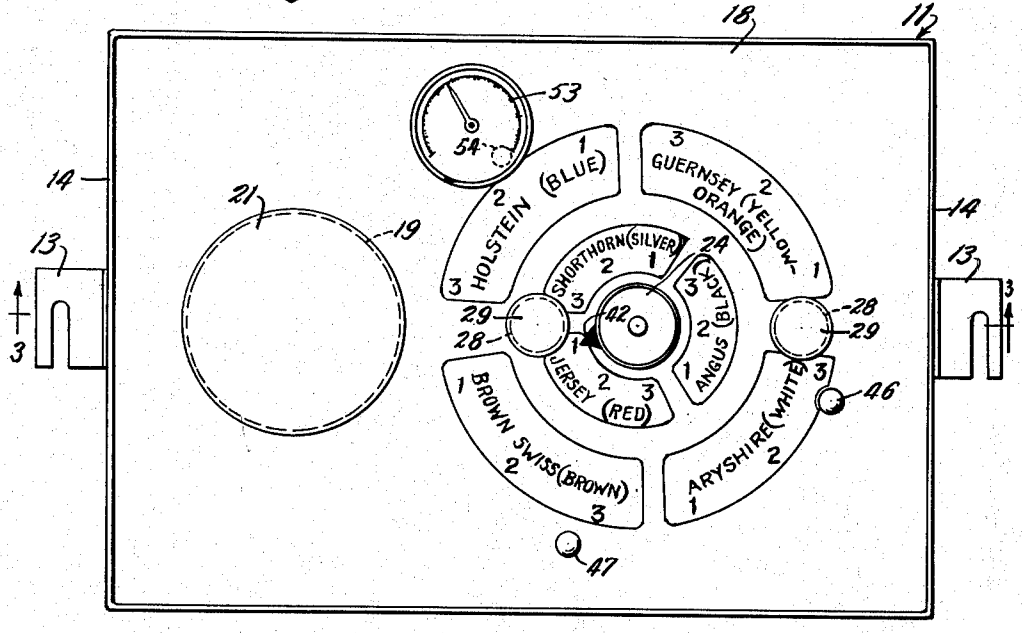


Fig-2

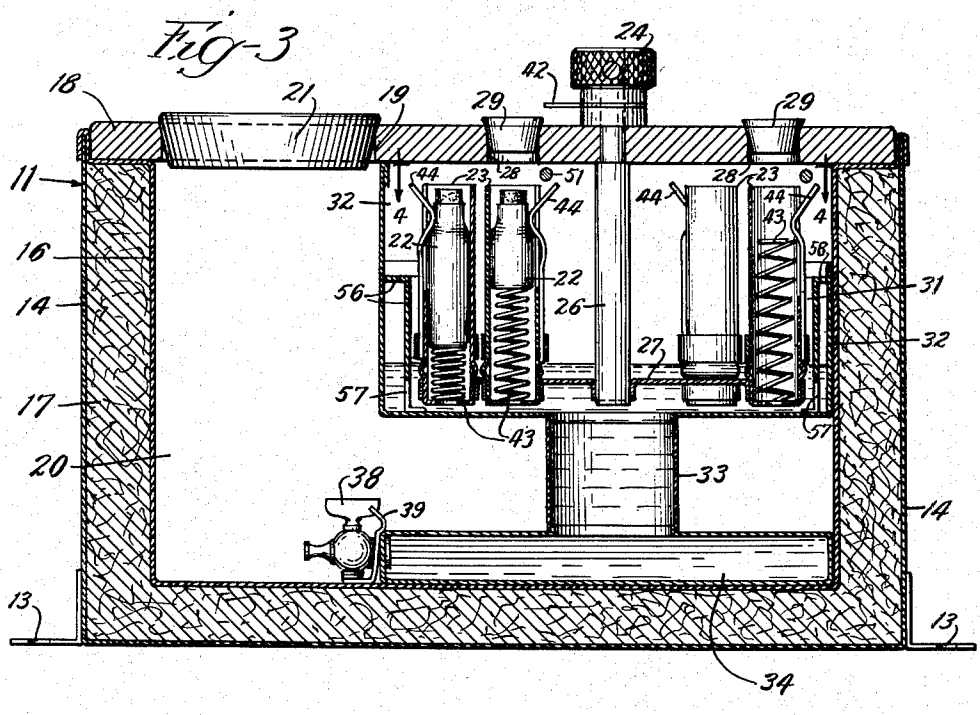
INVENTOR.
Mars M. Hornish
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DISPENSING REFRIGERATOR FOR ARTIFICIAL INSEMINATION

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Fig-3



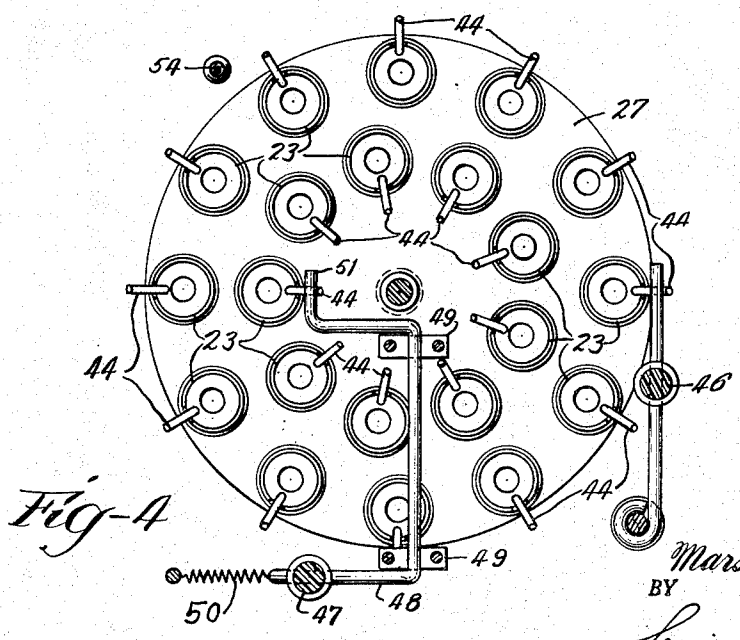


Fig-4

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DISPENSING REFRIGERATOR FOR ARTIFICIAL INSEMINATION

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Fig-5

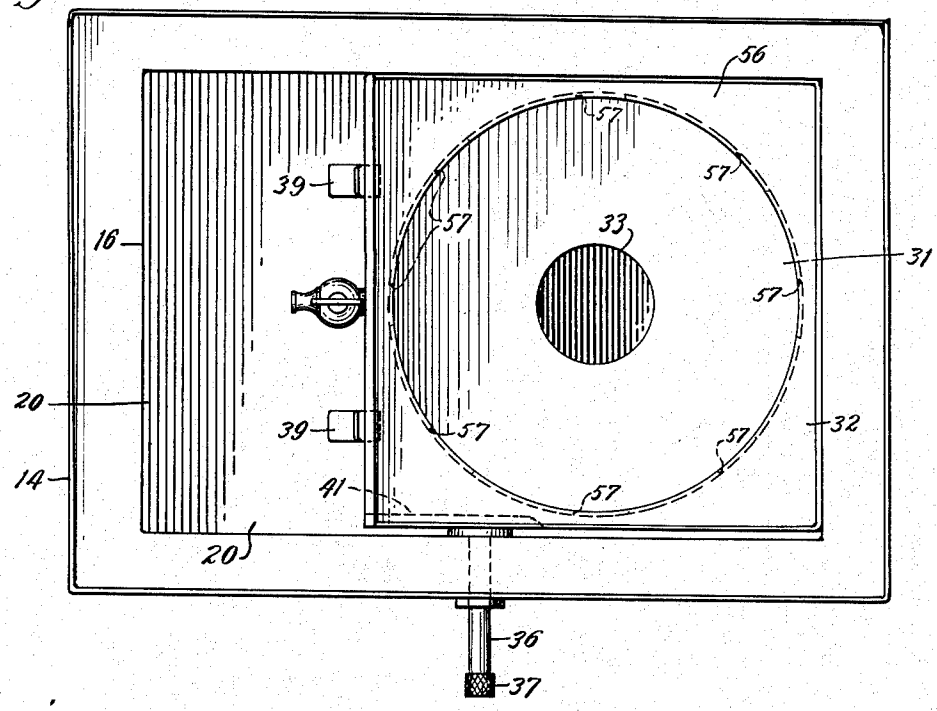
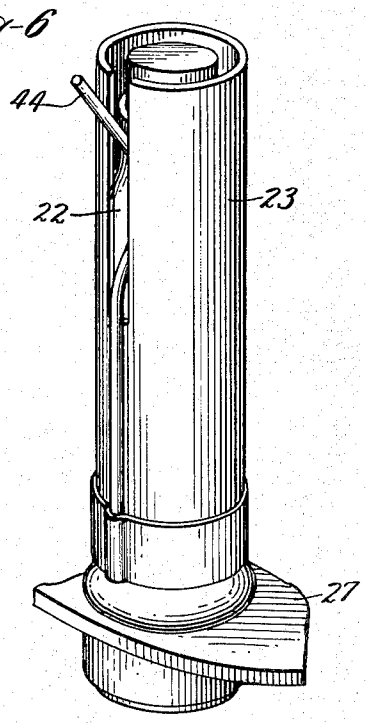


Fig-6



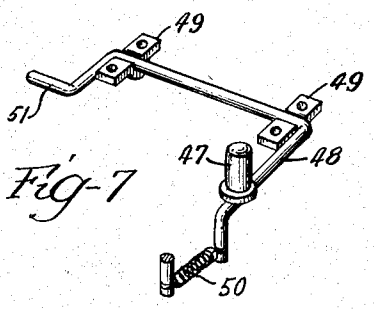


Fig-7

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United States Patent Office 2,695,729 Patented Nov. 30, 1954

2,695,729

DISPENSING REFRIGERATOR FOR ARTIFICIAL INSEMINATION

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Application February 27, 1951, Serial No. 212,979

2 Claims. (Cl. 221—79)

The importance of artificial insemination to the dairy industry has long been recognized. With artificial insemination, a much smaller number of bulls will suffice for the entire industry. Furthermore, the bulls whose offspring are determined to have exceptional qualities may be much more widely used.

Best practice requires that for any herd of cows at least three bulls be used. This might be said to be desirable for avoiding the dangers of inbreeding. Expressed less negatively, it is to be able to bring into the herd the most desirable qualities from several lines.

A veterinarian in a community or even on a large dairy farm with herds of various breeds needs to carry semen from a large number of bulls. For example, he is quite likely to have call for artificial insemination of seven breeds and it is desirable for him to have semen from three bulls in each breed. This means that he must have twenty-one vials of semen.

The vitality of the semen is dependent upon its being kept refrigerated. Best results are dependent upon maintaining the temperature of the semen in a rather narrow range close above the freezing temperature. According to the present invention, a refrigeration kit is provided which greatly facilitates the maintenance of the semen at the right temperature while at the same time giving the veterinarian ready access to any of the large number of vials he may be carrying.

Additional objects and advantages of the invention will be apparent from the description and from the drawings.

Designation of figures

Figure 1 is a perspective view of the refrigerating dispenser chosen for illustration of this invention, showing fragmentarily the outer insulated carrying kit as well.

Figure 2 is a view looking down on the top of the refrigerating dispenser of Figure 1.

Figure 3 is a vertical cross-sectional view taken approximately on the line 3—3 of Figure 2.

Figure 4 is a view looking down on the body of the rotor, being a sectional view approximately on the line 4—4 of Figure 3.

Figure 5 is a view looking down on the body of the refrigerating dispenser, the cover and rotor being removed.

Figure 6 is a perspective view of a vial holder forming part of the rotor, with a fragment of its supporting disk.

Figure 7 is a fragmentary perspective view illustrating one of the release mechanisms.

Although the law requires a full and exact description of at least one form of the invention, such as that which follows, it is, of course, the purpose of a patent to cover each new inventive concept therein no matter how it may later be disguised by variations in form or additions of further improvements; and the appended claims are intended to accomplish this purpose by particularly pointing out the parts, improvements, or combinations in which the inventive concepts are found.

General description

According to the present invention, a refrigerating dispenser **11** is preferably carried within an insulating case **12**, being secured therein by brackets **13** which may, for example, cooperate with a stud and thumb screw on the carrying case **12**. It may be noted that the carrying case **12** may resemble a suitcase or large toolbox and has space for other equipment needed by the veterinarian.

For example, there is preferably a tube-like case for maintaining in clean or sterile condition the insemination tubes, this case preferably being provided with means for dispensing a tube at a time without exposing the others to contamination.

The present invention relates mainly to the refrigerating dispenser **11**. The walls for this dispenser are preferably of an insulative type. For example, as seen best in Fig. 3, outer wall **14** and inner wall **16** may form a space between them filled with insulating material **17**. The walls **14** and **16** may be of stainless steel or other easily cleaned material. A cover **18** may be provided and it is preferably formed of a plastic of low heat conductivity. The cover **18** has a large opening **19**, through which ice cubes may be dropped into the refrigerating dispenser. The hole **19** is normally closed by a stopper **21**, which may be of rubber or other material of low heat conductivity.

The vials **22** which may be of two sizes, as illustrated, are carried in vial holders or tubes **23** which form part of a rotor or rack which may be turned by handle **24**. The handle **24** is mounted on a shaft **26**, which at its bottom carries a disk **27**. To the disk **27** are rigidly secured the various vial tubes **23**. These tubes may be secured to the disk in any suitable manner, either removably or permanently, or semi-permanently by a fairly tight press-fit, as illustrated.

It is desirable to maintain the vials **22** at a temperature a little above freezing without exposing them to the water which naturally accumulates as the ice melts and which is desirable in any event for ensuring good heat transfer between the ice and the parts to be cooled. If the vials were stationarily disposed, their cooling might be relatively simple. However, to increase the length of time during which the semen may be kept safely with a given quantity of ice, it is desirable to have only two openings **28** for the removal of the vials and accordingly the vials are rotatively mounted so that each of them may be positioned adjacent one or the other of the openings **28**. The openings **28** are normally closed by stoppers **29** of rubber or other material of low heat conductivity.

The illustrated method of maintaining the rotatively mounted vials at a desired temperature has proved quite satisfactory. Although these vials need not themselves be exposed to water, the tubular holders **23** extend well down into the well **31** of bowl **32**, which may be partially filled with water or not, depending on the temperature conditions or preferences of the veterinarian. In the summer time, it will ordinarily be preferred that the well **31** be partially filled with water, say to the level indicated in Fig. 3. The metal tubes **23** extending down into this water will have a temperature throughout close to the temperature of the water and hence will maintain the vials **22** at such temperature.

The well **31** preferably extends down to a connecting tube **33** to a base portion **34**. The ice and water admitted through the cover openings **19** will surround the tube **33** and cover the base **34**, thus thoroughly chilling the water therein.

As seen in Figs. 1 and 5, a drain tube **36** extends through the side wall of the refrigerating dispenser **11** and through the side wall of the outer carrying case **12**. This tube **36** is preferably plastic so that there will not be any great heat conduction through it. Its cap **37** may be removed to drain water from the refrigerating dispenser. Ordinarily, water within the well **31** may be left there, but at times it may be desired to drain this water and for that purpose a pet cock **38** is provided. This drains into the main body of the refrigerating dispenser **11** from which the water may be drained through tube **36**.

Whenever the water in well **31** has been allowed to get too warm, it would be desirable to drain this water so as to replace it with water of the right temperature. Likewise, some veterinarians will prefer to drain the water from the well **31** in the wintertime when the kit will ordinarily be exposed to freezing and sometimes very cold temperatures. Cold water will nevertheless be desired in the ice well **20** to keep the semen vials from getting too cold.

To facilitate cleaning the parts, the bowl **32** may be removable, in which case it may be held in position by spring clips **39**. Unless the construction is such as to hold the bowl **32** away from the drain tube **36**, a groove **41** may be provided in the side of the bowl **32** to ensure ready flow of water from the ice well **20** to the tube **36**.

Although each of the vials **22** will usually be labeled, it is highly desirable that some indicating means be provided so that the veterinarian may readily turn any desired vial to lie under one of the openings **28**. Probably about the simplest form of indicating means is that illustrated best in Fig. 2. The handle **24** is provided with a pointer **42** which points to indicia on the cover **18** or on panels secured to the cover. Thus the pointer **42** has been shown pointing to numeral 1 in the "Jersey" panel. It will be observed that this panel is on the inner circle of panels. This means that the vial of semen from bull No. 1 of the Jersey breed is positioned under the inner opening **28**. When the pointer **42** points to one of the numbers in the outer circle of panels, it indicates which vial is under the other of apertures **28**. If preferred, the indicia panels may be mounted to rotate with the rotor. In that event, the indicia panels may be above the cover, in which case they may be disposed to lie adjacent the aperture **28** when the indicated vial is under that aperture. Alternatively, the indicia panels may be located beneath the cover **18**, in which case a particular indicium may be visible through a window when the indicated vial is under one of the openings **28**.

To aid the veterinarian to remove a vial from its holder, each vial is preferably spring actuated and normally held in place by a releasable latch. Thus, as seen in Fig. 3, the vials **22** are urged upwardly by springs **43** and are restrained from upward movement by spring clips **44**. These clips may restrain the vials frictionally or by lying over a shoulder of the vial. To release the spring clip, one or the other of the buttons **46** and **47** is pressed. Thus the button **46** will release the clip of the vial under the outer opening **28** while the button **47** will release the clip under the inner opening **28**. Any suitable means may be provided for enabling the buttons to release the latches. As a matter of fact, in one model, the buttons were positioned adjacent the openings **28** and were merely the top portions of plungers which thrust directly against the latches. It is believed that more uniformly satisfactory release action would be provided by a more refined releasing device, such as that seen in Fig. 7. Thus the button **47** may press one end of a crank **48** which is pivotally secured to the cover **18** by brackets **49**. At the other end of crank **48**, a pin **51** forming part of the cranked lever is pressed down to actuate the latch **44**. A return spring **50**, extending from a pin on lid **18**, biases crank **48** in the return direction.

It is desirable for the veterinarian to be able to determine readily the approximate temperature of the vials. To this end, a thermometer **53**, preferably of the dial type, as shown, may be provided. The bulb **54** of this thermometer has been shown as exposed to the air space in which the vial tubes **23** are located. Although the thermometer may often show a temperature a little higher than the actual temperature of the vials, it will nevertheless enable the veterinarian to know when the danger point is being approached. If desired, a tube

similar to vial tubes **23** may be placed around the thermometer bulb **54** and extended down into the water into which the vial tubes **23** extend. In this way the thermometer may be made to indicate the vial temperatures more accurately.

The bowl **32** may be of any desired height so long as it extends above the bottoms of vial tubes **23**. Preferably it extends well above this level so that water at this level will not splash out readily. The bowl **32** may be open at its top, the sides converging at their top portions to minimize loss of water by splashing. As shown, splashing may be reduced further by a partition **56** extending in from the outer bowl wall and down. If it extends to the bottom of the storage space, large apertures **57** are provided to allow the water to circulate.

For convenience, the different breeds may appear on panels of different colors, as indicated.

I claim as my invention:

1. In a dispensing container having an insulated, watertight shell and a rack adapted to hold the units to be dispensed mounted therein, the combination of a temperature modulating unit positioned beneath said rack comprising a hollow container adapted to position a column of water beneath said rack, a space surrounding said hollow container adapted to contain ice; said rack including metallic tubular members surrounding said units and extending therebelow to a position within said temperature modulating unit at a level below a level at which the column of water may be maintained.

2. In a dispensing container having an insulated, watertight shell with a removable lid and a rack adapted to hold the units to be dispensed rigidly affixed to the lower end of a rotatable shaft extending vertically through said lid, the combination of at least one set of receptacles each adapted to hold one unit borne by said rack at spaced intervals surrounding said shaft, the receptacles in each set being equidistant from said shaft, a spring positioned at the bottom of each receptacle to bias upwardly a unit placed in said receptacle, a lock positioned at the top of each receptacle to hold said unit within said receptacle, release means extending through said lid to release said lock, and an opening in said lid for each set of receptacles the same distance from said shaft as its associated set of receptacles through which to insert and remove units in said receptacles.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
969,747	Clay	Sept. 6, 1910
1,013,795	May	Jan. 2, 1912
1,275,655	Boye	Aug. 13, 1918
1,505,441	Smith	Aug. 19, 1924
1,633,588	Klinenberg	June 28, 1927
1,732,359	Gilmore	Oct. 22, 1929
1,741,563	Graham	Dec. 31, 1929
1,979,785	Wroten	Nov. 6, 1934
2,028,926	Seeger	Jan. 28, 1936
2,155,502	McMurray	Apr. 25, 1939
2,218,317	Parker	Oct. 15, 1940
2,308,989	Melchert	Jan. 19, 1943