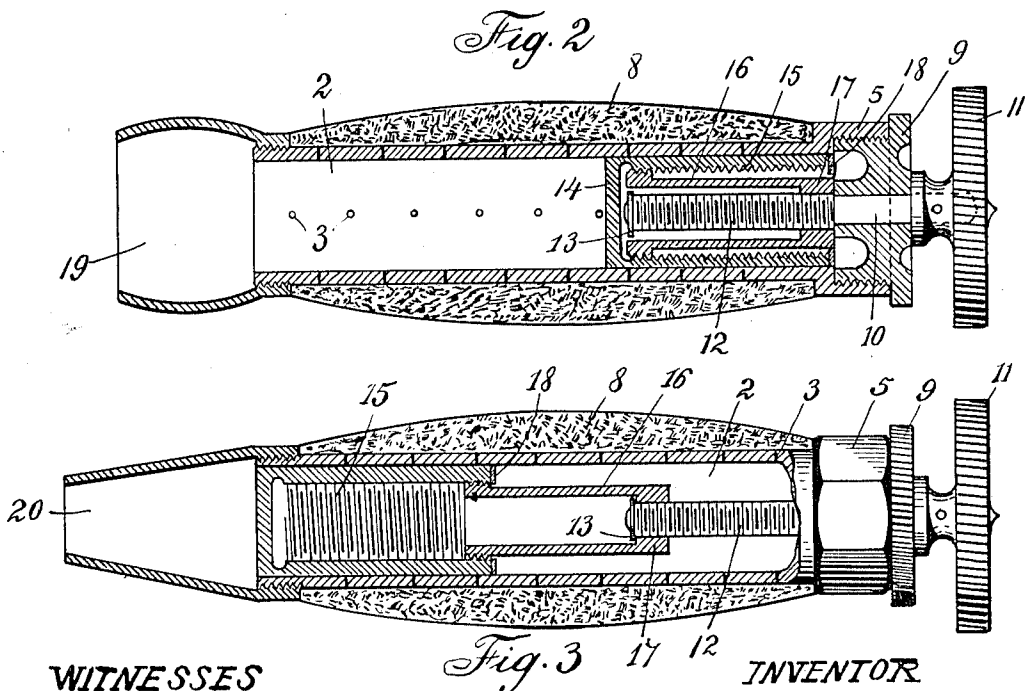
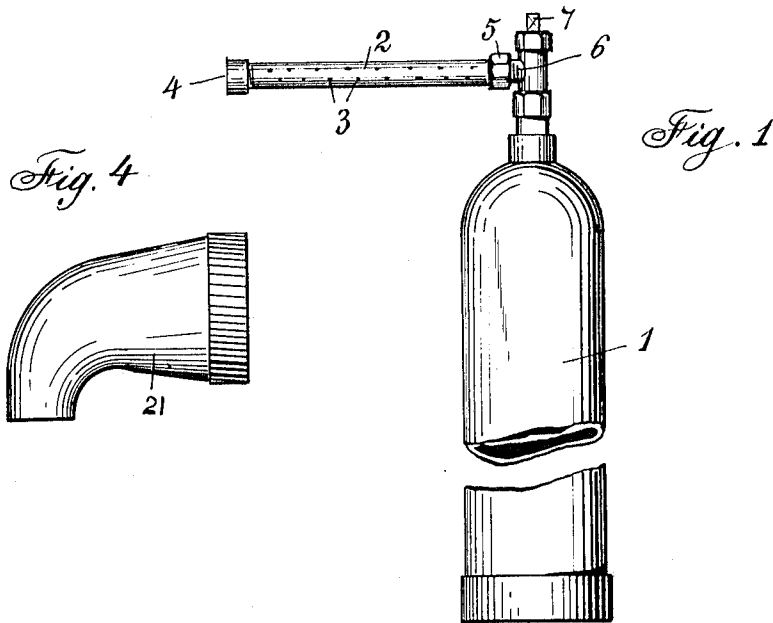


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SURGICAL INSTRUMENT.
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Patented Jan. 25, 1910.



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SURGICAL INSTRUMENT.

947,382.

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To all whom it may concern:

Be it known that I, JUSTUS C. GOOSMANN, a citizen of the United States, and residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Surgical Instruments, of which the following is a complete specification.

This invention relates to improvements in surgical instruments and more particularly to an instrument adapted to form crystallized carbon dioxid and apply it to the surface treated.

Crystallized carbon dioxid is often employed for treating certain skin diseases and blemishes, such for instance as the removal of scars, warts, moles etc., by the destruction of the tissue through the use of low temperature, but heretofore no adequate means have been provided for forming and storing the crystals in a device convenient for applying them. Instead it has been usual to permit the carbon dioxid to escape from the tank into a porous sack and the rapid expansion of the gas causes a drop in the temperature and the formation of crystals on the interior of the sack. These are then collected and formed by hand into balls or pellets of suitable size and applied to the surface to be treated by means of any instrument capable of holding the ball against the surface.

The main objects of this invention are to provide a device adapted to have carbon dioxid crystals formed therein, and then compacted or compressed into suitable form to be applied to the surface to be treated, and also to apply the crystals without removing them from the device in which they are formed. It is also an object of the invention to provide a novel device for compressing the crystals into convenient form for use, and which may be quickly attached or removed from the forming cylinder when desired.

A specific construction embodying said invention is illustrated in the accompanying drawings, in which:

Figure 1 is a fragmentary, side elevation of a carbon dioxid tank showing the forming cylinder attached thereto. Fig. 2 is an enlarged longitudinal section of the forming cylinder with the compressing mechanism, insulating cover and applicator attached thereto. Fig. 3 is a view similar to Fig. 2

but showing the compressing mechanism extended. Fig. 4 is a side elevation of one form of applicator.

In the construction shown in said drawings, 1 indicates a carbon dioxid tank of the usual construction, and attached to the outlet thereof is the forming cylinder 2. Said cylinder comprises a pipe section having a plurality of perforations 3 in the sides thereof, and having one end closed by a tight fitting cap 4. The other end of said cylinder is provided with an enlarged, internally threaded flange 5, which is adapted to be screwed onto the outlet 6 of said tank, and is formed on its outer side to receive a wrench or the like. To form crystals in the cylinder the valve 7 of the tank is opened and the carbon dioxid escapes into said cylinder, and the rapid expansion of the gas causes the formation of crystals on the inner side thereof. When a sufficient quantity of crystalline carbon dioxid has been formed the cylinder is removed and an insulating cover 8 of cork or other suitable material is placed over the same to protect the hand from injury while using the cylinder.

For the purpose of compressing the crystallized carbon dioxid in said cylinder after the latter has been removed from the tank, a compressing device is attached thereto. In the construction shown the compressing device comprises a nut 9 adapted to be engaged in the flange 5, and journaled axially therein is a shaft 10. Said shaft is provided on its outer end with a knurled head 11, by means of which the shaft may be rotated, and the inner end 12 of said shaft is screw threaded and provided with a washer or flange 13. Slidably secured in said cylinder is a hollow piston 14, having internal screw threads 15, and a sleeve 16 is provided with external threads on its inner end which engage in said threads 15. The outer end 17 of said sleeve, or that adjacent the nut 9, has its bore reduced in size and screw threaded to engage the end 12 of said shaft. On the end of said piston adjacent the nut 9 is secured a flange 18 adapted to prevent the withdrawal of the sleeve 16 when the compressing mechanism is fully extended, as shown in Fig. 3.

When it is desired to use the instrument the carbon dioxid is crystallized in the forming cylinder, as before described, and the cylinder is removed from the tank. The cap 4 is removed from the end of the cylinder

and the insulating cover is slipped over the cylinder and the cap again secured in place. The piston 14 is then inserted in the opposite end of the cylinder and as it enters it
 5 forces the crystallized carbon dioxid at the end of the cylinder toward the center thereof. The nut 9 is then secured in the flange 5 and the shaft 10 is rotated in a direction to force the sleeve 16 to the inner end of the
 10 threaded portion 12. Owing to the threaded connection between the sleeve and said piston the latter is forced inwardly with the sleeve, thereby moving the crystallized carbon dioxid nearer the mouth of the cylinder
 15 and compressing it against the cap 4. When the washer or flange 13 reaches the reduced portion 17 of said sleeve it binds thereon and further rotation of the shaft in said sleeve is prohibited, and the sleeve is caused to rotate
 20 in the piston, which movement forces the piston farther toward the mouth of the cylinder.

When the carbon dioxid has been sufficiently compressed the cap 4 is removed and
 25 a mouth piece or applicator 19, 20 or 21 is secured in its place. The form of the applicator will vary according to the nature and location of the part treated. The open end of the applicator is placed over the part to
 30 be treated and the shaft rotated farther to force the compressed crystals into contact with said part. As the compressed ball is consumed by evaporation it is kept in contact with the surface by the rotation of said
 35 shaft. When it is desired to retract the piston the shaft is rotated in the opposite direction and causes the piston and sleeve to return to normal position.

Obviously a device constructed in accordance with this invention provides a very
 40 convenient means for forming crystallized carbon dioxid and for applying the same in surgical treatment, and obviously also many details of form and construction may
 45 be varied without departing from the principles of this invention.

I claim as my invention:

1. The combination with a perforated cylinder adapted to collect crystallized carbon
 50 dioxid therein, a piston in said cylinder, and longitudinally extensible means in said cylinder adapted to operate said piston.

2. The combination with perforated means adapted to receive gaseous carbon dioxid
 55 therein and to form crystallized carbon dioxid on its inner surface, compressing mechanism in said perforated means adapted to compress the crystallized carbon dioxid into a compact mass, and means for operating
 60 said compressing mechanism.

3. The combination with a cylinder having a plurality of perforations therein, of an
 65 insulating cover on said cylinder, a piston in said cylinder, a shaft journaled axially of said cylinder, and means connecting said

shaft and said piston and acting when the shaft is rotated to move said piston longitudinally of the cylinder.

4. The combination with a cylinder of an internally threaded piston therein, a threaded
 70 shaft journaled axially of said cylinder, a sleeve having threaded connection at one end to said shaft and at the other end in said piston and means on the inner end of
 75 said shaft adapted when the sleeve has reached the inner limit of its movement to lock the sleeve to the shaft and cause it to rotate in the piston therewith.

5. The combination with a perforated cylinder of longitudinally extensible compression
 80 means therein and a removable insulating cover on said sleeve.

6. The combination with a perforated cylinder adapted to form crystallized carbon
 85 dioxid therein, means adapted to close the perforations in said cylinder, and means connected with said cylinder adapted to compress said crystals.

7. The combination with a perforated cylinder of removable means on said cylinder
 90 adapted to close the perforations therein, a shaft journaled in one end of said cylinder, and a piston connected with said shaft and adapted when the latter is rotated
 95 to travel longitudinally.

8. A device for forming and compressing crystallized carbon dioxid, comprising a
 100 perforated cylinder, a piston therein, and means for operating said piston.

9. A surgical instrument comprising a
 105 perforated cylinder, an insulating cover therefor, a piston in said cylinder, and means for operating said piston.

10. The combination with a perforated cylinder of a nut adapted to be engaged in
 110 one end thereof, a shaft journaled in said nut and having its inner end threaded, a sleeve having threaded engagement on said shaft, means adapted to limit the rotation
 115 of said shaft in said sleeve, an internally threaded piston having threaded engagement on said sleeve, and an insulating cover on said cylinder.

11. The combination with a perforated cylinder of an insulating cover therefor,
 120 compressing means in said cylinder, and an applicator on one end of said cylinder.

12. The combination with a cylinder of a piston therein, rotative means adapted to
 125 move the piston longitudinally of the cylinder, and an applicator on one end of said cylinder and an insulating cover on said cylinder.

13. The combination with a carbon dioxid tank of a perforated cylinder adapted to be
 130 attached to the outlet thereof, and to form crystallized carbon dioxid on its inner surface.

14. The combination with a carbon dioxid tank of a perforated cylinder adapted to be

attached thereto, and means closing the end of said cylinder.

15. A surgical instrument comprising a perforated shell adapted to form crystallized carbon dioxid, means adapted to compress said crystals, and an applicator adapted to be placed over the surface treated.

16. A surgical instrument comprising a perforated receptacle adapted to collect crystallized carbon dioxid on its inner surface, means therein adapted to compress the crystallized carbon dioxid, and means connected with the receptacle adapted to support the compressed crystals against the surface treated.

17. A surgical instrument comprising a

cylinder adapted to collect crystallized carbon dioxid therein, a cap adapted to close one end of said cylinder, means adapted to be engaged on the other end of said cylinder and when operated to compress the carbon dioxid against said cap, and an applicator adapted to be substituted for said cap and to shape the compressed mass and retain it against the surface treated.

In testimony whereof I have hereunto subscribed my name in the presence of two witnesses.

JUSTUS C. GOOSMANN.

Witnesses:

JOE. SIMONS,
ROBT. KLOTZ.