

UNITED STATES PATENT OFFICE.

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PACKAGE OF CARBON DIOXIDE AND PROCESS FOR MAKING THE SAME.

No Drawing.

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Prior to my invention, it has been customary to ship carbon dioxide in liquid form in steel containers. Such containers are heavy and therefore expensive to ship adding greatly to the shipping cost of the liquid, and furthermore, are bulky whether full or empty so that the cost of the return of these containers is but little less than that of shipping them to the consumer. Furthermore, these containers are in themselves a considerable item of expense to manufacture and maintain. In the practice of my invention, the carbon dioxide gas is shipped in the solid state preferably well compacted and in containers so cheap that they may be discarded or, returned for re-use, the cost of reshipping them is but slight.

In the practice of my invention the carbon dioxide may be manufactured and reduced to the solid state in any desired or known manner as for example by permitting the vapors from liquid carbon dioxide to escape rapidly from the container which results in the formation of the solid carbon dioxide due to the cooling of a portion of the vapors permitted to escape. Other ways of making solid carbon dioxide are well known. The solid material formed in the manner referred to above is flaky or granular and it is desirable to reduce its volume before shipment by condensing or compacting it. This may be done by a variety of mechanical means of an obvious character and which it is unnecessary to describe. After the material has been properly compacted, it is placed in pervious absorbent containers. I have used for this purpose with satisfactory results coarse fabric sacks, unbleached muslin being satisfactory for the purpose. After the solid carbon dioxide has been charged into the sack, I preferably spray the package with water or dip it therein whereupon the absorption of heat from the water by the carbon dioxide quickly congeals the water absorbed by the fabric and any water which is retained between the fabric and the carbon dioxide, thus closing the pores and mesh of the fabric and surrounding the

solid carbon dioxide with a substantially continuous enclosure of ice. Somewhat the same effect is obtained by exposing the fibrous package containing the carbon dioxide to the atmosphere, particularly if the latter is fairly moist, but preferably the package is moistened as heretofore described. It is within my invention in its broader aspect to enclose the carbon dioxide in other fibrous or absorbent containers or materials than that described, but I have found the muslin sacks to answer the purpose satisfactorily as they are cheap, readily absorb water and after their contents have been removed, they may be packed in very small space for return to the shipper. By forming a covering of ice about the carbon dioxide, it is not only mechanically protected and prevented from wasting in this manner, but by maintaining a stagnant atmosphere which approaches the saturation point in carbon dioxide the gasification of the latter is greatly retarded. Thus, though the material cannot be entirely prevented from vapors or gasifying, its escape is so slow that it may be economically shipped long distances for use. As escape of the gas developed is not prevented, there is no danger of explosion. Furthermore, the shipment and handling of the material is entirely clean as any small particles or fragments which escape from the containers simply pass off into the atmosphere.

It is sometimes convenient to avoid mechanical injury to the fibrous containers to pack the sacks of carbon dioxide in some heavier material or casing of such a nature that the escape of vapors and gas is not prevented.

I claim:

1. A package of carbon dioxide in solid form enclosed in absorbent material.
2. A package of carbon dioxide in solid form enclosed in an absorbent fabric.
3. A package of carbon dioxide in solid form enclosed in an absorbent fabric impregnated with ice.
4. A process of packing carbon dioxide for shipment which consists in solidifying

the same and surrounding it with an absorbent container.

5. A process of packing carbon dioxide which consists in solidifying it, surrounding it with an absorbent container and saturating the container with water.

6. A process of packing carbon dioxide

for shipment which consists in solidifying the carbon dioxide, compacting it, enclosing it in a container of absorbent material and saturating the container.

In testimony whereof, I have subscribed my name.

GEORGE B. BLANCHARD.