To all whom it may concern:

Be it known that I, GRAY STAUNTON, a citizen of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Vacuum Packing Apparatus, of which the following is a specification.

My invention relates to improvements in vacuum packing apparatus, and has for its general object to provide means for packaging material in air-tight receptacles, to be maintained sealed by preponderance of atmospheric pressure over a reduced pressure existing within the receptacle.

More particularly an object of my invention is to provide a vacuum packing apparatus wherein the receptacle coacts directly with the exhausting apparatus, so that the exhausting apparatus may create in an area local to itself and the receptacle an attenuated atmosphere, the cover of the receptacle, as an entirety, being completely inclosed within the area of the exhausting means and receptacle and free for movement to permit egress of air from the receptacle into the exhausting means, and to seat upon the receptacle to prevent return of air from the exhausting means to the receptacle, so that when the exhausting means has been operated and is removed from association with the receptacle the cover is maintained in sealing relation to the receptacle by the preponderance of normal atmospheric pressure without the receptacle over the pressure of the attenuated atmosphere within such receptacle.

Further my invention contemplates the provision of new and improved exhausting means, and an improved receptacle sealing cover, readily releasable when desired for the advantageous embodiment in such vacuum packing apparatus.

In the single sheet of drawings illustrating an operative embodiment of my invention: Figure 1 is a side view partly in elevation and partly in section of a packing apparatus, and; Fig. 2 is a plan view of a fragment of my improved cover.

In general my improved packing apparatus includes a receptacle 5, a sealing cover 6, and an exhausting means 18 for mechanical association with the receptacle to cooperate with said receptacle and the cover in operation. The receptacle 5 may be of any suitable character and configuration, the receptacle herein illustrated for purposes of disclosure being a plain glass jar or receptacle, provided at its upper end with a simple exterior thickened portion or bead 8. The cover 6, of course, of suitable contour for conformity with the open end of the receptacle 5, and is preferably a plain glass or other imperforate cover, providing a central boss as at 7 and a peripheral flange 8, of slightly less diameter than the exterior diameter of the bead 6 of the receptacle, and preferably beveled toward its upper surface, as shown at 9, the juncture of said flange 8 and the thickened portion of the cover, forming a shoulder 10 which affords a seat for a packing ring 11 of rubber or other yielding material of a nature impermeable to air, and adapted to effect a sealing contact with a suitable portion, such as the inner edge of the rim of the receptacle 5, to hermetically close the receptacle under the influence of a preponderating exterior pressure, said packing member being herein shown as a triangular ring, which may be and preferably is of the construction and arrangement described in my prior Patent Number 855,166 dated November 6, 1909.

The ring is preferably arranged to be overhung throughout substantially its entire extent by the flange 8 of the cover, so that when the cover is in place said ring is, substantially throughout its extent, practically inaccessible from the exterior of the package; but to permit of access to said package member for the purpose of effecting an opening to admit air to the interior of the receptacle, a notch or recess 12, preferably of small dimension is made into and through the flange 8, so that a pin or other small implement may be inserted in the space thus provided, and pressed in between the ring 11 and the edge of the receptacle with which it coacts in effecting the seal, thereby opening an air passage to relieve the vacuum tendency in the receptacle. Thus the receptacle is provided with a cover, which when in place leaves exposed the exterior edge of the upper end or mouth of the receptacle, but which overlies, protects and affords a secure seat for the packing element 11.

The exhausting apparatus 13 shown, may generally be of any suitable character, that apparatus herein shown consisting of a small hand pump, providing a shell 14, and a stem 15 carrying at its lower end a piston or plunger 16, and provided with a connection
base 17 of suitable character and construction to make sealing contact with the receptacle beyond the confines of the cover, so that the receptacle, connection base, and pump proper form an area completely including the cover as an entirety, within which said area the atmosphere may be attenuated by the action of the pump. Specifically the connection member 17 is a base enlargement of the shell 14 of the pump, detachably connected to said shell, and providing an annular plate 18, from which depends an integral skirt or downwardly flaring flange 19, carrying on its inner surface an inclined, yielding packing ring 20, of soft rubber or the like, adapted and arranged to make sealing contact with the rim 6, of the receptacle, beyond the confines of the cover flange 8.

At some suitable point, as in the plate portion 18, the exhausting apparatus is provided with a relief aperture 21, normally closed by a valve 22, shown as a strip of rubber carried by a spring 23, which may be manually lifted to open the aperture 21, and permit ingress of air above the cover 7, of the receptacle. As a further refinement the exhausting apparatus may be provided with yielding flanges 24, secured to the plate 18, to yieldingly position the cover 7 when the connection base is applied to the receptacle; and yet another refinement where a simple hand pump is employed, as herein shown, the stem 15 may be provided with a yielding tip 25, so arranged that on the down stroke of the plunger said tip strikes upon the cover 7 imparting thereto a blow which tends to set it in sealing relation to the receptacle.

In the operation of the vacuum packing apparatus described, the receptacle is filled with the desired material to be preserved, the cover is laid thereon and the exhausting means applied with the sealing ring 20 making air-tight contact with the rim of the receptacle by reason of compression downwardly applied. With each upstroke of the piston the cover, completely inclosed within the area of the exhausting means and receptacle, rises sufficiently to permit air to be drawn out of the receptacle, and upon the return stroke of the pump piston seats through the medium of its sealing ring 11 to prevent ingress of air into the receptacle. When a sufficient degree of rarefaction is attained within the receptacle by such action, the valve 22 may be lifted to open the aperture 21 and permit ingress of air into the connection base to relieve the rarefaction therein, and to permit the exhausting apparatus to be freely detached from the receptacle without interference with the seal effected between the receptacle and its cover. The cover is, of course, held in position by the preponderance of exterior pressure thereon, and when it is desired to release the cover a pin or other sharp instrument is simply pushed in through the recess 12 to crowd back the yielding sealing ring 11 from the edge of the receptacle and permit ingress of air until the pressure within and without the receptacle is balanced, so that the cover may simply be lifted off.

While I have herein described in some detail a particular embodiment of my invention which I believe to be new and advantageous in details of construction, it will be apparent that my invention might be embodied in apparatus widely differing in structural features from those herein described, and I do not desire to be understood as limiting my invention to the particular details shown further than as specified in the claims.

Having described my invention, what I claim and desire to secure by Letters Patent, is:

1. In a vacuum packing apparatus, the combination with a receptacle having therein a single aperture surrounded by an annular wall having a rounded exterior edge, of a cover adapted and arranged to overlap and effect a sealing contact with the inner edge of said wall under the influence of preponderating exterior pressure, and an air exhausting pump providing an open-end outwardly flared connection base secured to the pump and arranged to make sealing contact directly with the outer edge of said annular rounded surface beyond the cover, said base fitting closely around and extending above the cover but leaving the latter free for movement in response to the exhausting means.

2. In a vacuum packing apparatus, the combination with an open-mouthed jar, having a rounded exterior edge, of a wide, solid cover therefor, mechanically free from the jar, a packing ring carried by the cover, arranged to make sealing contact with the mouth of the jar wholly within the confines of the outer edge, and an air-exhausting pump having secured thereto an open-end outwardly flared base carrying a flaring yielding packing ring arranged to make angular sealing contact with the outer rounded edge of the jar mouth wholly beyond the cover, to permit the cover to act as a valve during sealing operations.

3. In a vacuum packing apparatus, the combination with a receptacle having a single aperture surrounded by an annular wall having a rounded exterior edge, of a cover adapted and arranged to effect a sealing contact with the inner edge of said wall, and to lie wholly within the outer edge thereof, and an air-exhausting pump carrying an open-mouth outwardly flaring connection base arranged to make direct sealing contact with the outer rounded edge of the said wall...
beyond the cover, to include within the receptacle an area in which the atmosphere may be attenuated by the exhausting means, and completely enclosing the cover, said connection base being provided radially beyond the pump-barrel, with a normally closed pressure-relief valve.

4. The combination with an open-mouthed jar, having a vertical cylindrical side wall, reinforced with a rounded bead at the upper, outer edge thereof, of a solid cover providing a central boss to fit within the mouth of the jar, a laterally projecting flange to overlie the rim of the jar within the outer edge thereof, and a sealing rim of triangular cross section carried by the boss having a surface inclined from the plane of the jar mouth for contact with the inner portion of the jar mouth, and an air pump carrying an open outwardly flaring mouthed connection base arranged for directly sealing contact with the bead of the jar beyond the cover, leaving the cover free for limited movement within the base.

5. In an exhausting apparatus for sealing vacuum packages, a pump, a cover body, a wide solid base for said pump provided with a sealing part for coaction with the receptacle, and resilient fingers on the underside of said base to position the cover on said receptacle by contact with the upper surface thereof and yieldable to permit vertical movement of said cover for passage of air from the receptacle beyond the cover.

6. In an exhausting apparatus for sealing vacuum packages, the combination with a package having an open mouth and a cover therefor having a packing ring for coaction with the edge of the mouth, of a pump structure providing a cylindrical body part, a base member secured thereto, a packing ring thereon for coaction with a portion of the package when the base is placed over the cover, a valve in said base member, a piston for functional movement in the cylinder portion of the pump, and a yielding tip arranged on the piston to impart a blow upon the cover when the piston is driven to its lower limit of movement.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

GRAY STAUNTON.

In the presence of—

Geo. T. May, Jr.,

Mary F. Allen.