May 14, 1963 J. J. CRESKOFF 3,089,722

PORTABLE VACUUM IMPLEMENT

Filed Dec. 26, 1961

FIG. 1

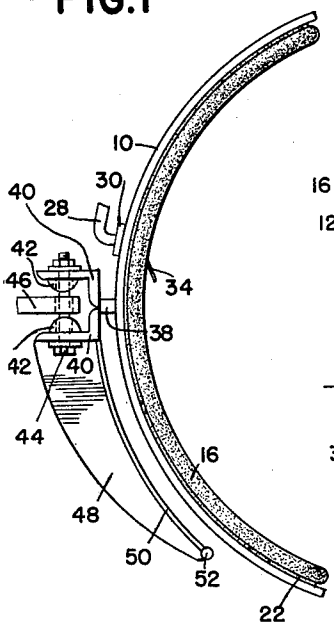


FIG. 2

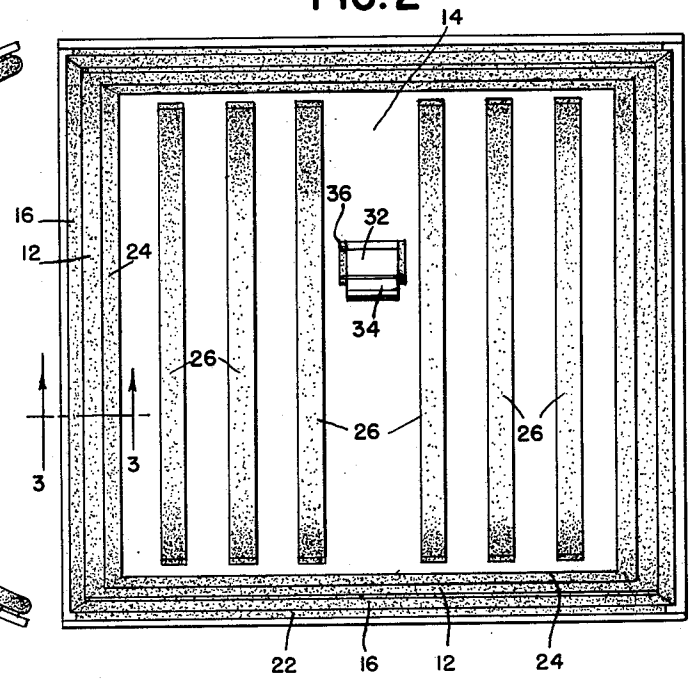
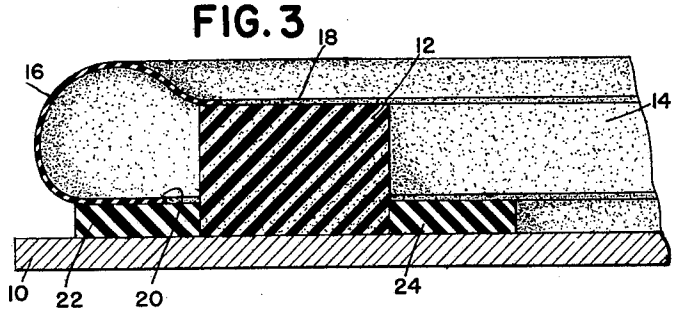


FIG. 3



INVENTOR

JACOB J. CRESKOFF

BY Raymond W. Cotton

ATTORNEY

United States Patent Office

3,089,722

Patented May 14, 1963

3,089,722

PORTABLE VACUUM IMPLEMENT

Jacob J. Creskoff, Wynnewood, Pa., assignor to Vacuum Concrete Corporation of America, Philadelphia, Pa., a corporation of Pennsylvania

Filed Dec. 26, 1961, Ser. No. 162,118
7 Claims. (Cl. 294—65)

This invention relates to a portable vacuum implement and represents improvements over such prior art devices as those illustrated by the patents to Karl P. Billner, 2,455,650, dated December 7, 1948, and 2,578,220, dated December 11, 1951.

In those patents, the use of limp elastomeric flaps was contemplated to assist in the production of an initial seal between the equipment and the load to be handled. Such limp elastomeric flaps invariably included curls or corrugations so that substantial leakage still occurred under many conditions of operation. As disclosed in copending application Serial No. 162,119, filed December 26, 1961, the disadvantages of the prior art patents have been overcome to some degree by applying tension to such flaps before they are joined to the implement so as to avoid the curl or corrugation effect. Even this improved concept involves difficulties, on occasion, because the flap becomes rolled by engaging an object so as to extend under the implement rather than outwardly therefrom. It is to avoid difficulties of these types that the present invention contemplates among its objects the provision of a portable vacuum implement comprising a plate providing a work surface, a compressible resilient elastomeric sealing gasket having interconnected cells secured to the surface and defining therewith an open chamber, an air impervious resilient elastomeric flap having an edge secured peripherally to the gasket and a second edge anchored peripherally beyond the gasket, the flap and gasket defining a tubular passage, and means communicating with the chamber for exhausting the same. The implement preferably includes restraining means secured to the second edge and the plate peripherally beyond the gasket, the restraining means being composed of an air impervious elastomeric material maintained free of the gasket. Such restraining elements may be applied on opposite sides of the gasket. A portion of the flap normally projects beyond the surface a distance greater than the gasket to establish initial contact with a load. The plate may be arcuate and may have a substantially cylindrical configuration.

A more complete understanding of the invention will follow from a description of the accompanying drawings wherein:

FIG. 1 is an end elevation of an implement incorporating the present invention;

FIG. 2 is an elevation of the implement looking from the right of FIG. 1; and

FIG. 3 is a fragmentary sectional elevation on an enlarged scale taken along line 3—3 of FIG. 2.

The implement depicted in the drawings comprises an arcuate plate **10** which may be substantially cylindrical, composed of steel or other flexible resilient material capable of supporting substantial loads. A compressible resilient elastomeric sealing gasket **12** is arranged about the periphery of the concave surface of the plate **10** to define therewith an open chamber **14**. An air impervious resilient elastomeric flap **16** has an inner edge **18** secured peripherally to the gasket **12** and an outer edge **20** anchored peripherally beyond the gasket to a stop **22** whose opposite surface is secured to the plate **10**. In this manner, the flap and gasket define a tubular passage and since both edges of the flap **16** are adhesively held, there is no danger of the flap being drawn inwardly under operating

conditions. The stop **22** is adhesively secured to the plate **10** but it is not adhesively secured to the contiguous portion of the gasket **12**. Similarly, an inner stop **24** is adhesively secured to the plate **10** but free of the contiguous surface of the gasket **12** so that the gasket **12** is unrestrained with regard to compression in depth while it is very definitely restrained against relative lateral movement.

The gasket **12** is formed of an elastomer sponge such as "neoprene" having inter-connected cells of relatively small size, preferably less than one-eighth inch, so that under conditions of compression, the air contained by the cells can be expelled permitting rapid and uniform compression of the gasket when subjected to loading. Intermediate supports **26** having a composition and thickness similar to that of the gasket **12** are arranged within the chamber **14** to prevent excessive local deflection of any portion of the plate **10** under load. The chamber **14** is provided with a connection to a vacuum pump, not shown, through a fitting **28** welded to a pad **30** which is in turn welded to the convex surface of the plate **10**, a valve **32** pivotally carried within the chamber **14** controlling the passage of fluid through the fittings. The valve **32** has a normally closed position as depicted in FIG. 2 to which it is biased in a suitable manner such as by constructing the valve of a material having spring properties. An operator **34** carried by the valve, normally projects forwardly from the concave surface of the plate for engagement with a load, such as a paper roll, to be handled. Upon engagement of the operator with the object, the valve will be lifted from its seat **36** permitting air within the chamber **14** to be exhausted and the load to be grabbed. Inasmuch as the intermediate supports **26** do not extend entirely to the gasket **12**, it will be clear that the movement of fluid from all portions of the chamber will occur as soon as the load has been engaged.

Substantially centrally of the plate **10**, a rib **38** is attached by welding to which a pair of angles **40** are welded. Each of these angles has a hemispherical abutment **42** welded thereto and a coupling bolt **44** passes through the angles and hemispheres for cooperation with a tongue **46** carried by a handling device such as a lift truck. By forming the openings through the angles and hemispheres substantially larger than the diameter of the bolt **44**, a substantial degree of relative movement can be achieved in all directions so as to render the implement substantially self registering with a load with a minimum requirement of manipulation of the handling device such as the lift truck carrying the tongue **46**. The hemispherical configuration of the abutments **42** will facilitate the desired registration and relative movement. Depending from the lower angle **40**, as viewed in FIG. 1, there is a tapered arcuate rib or beam **48** welded at its upper end to the angle **40** and to a metal apron **50**. To the lower edges of the beam **48** and apron **50**, a rod **52** is welded and extends along the major portion of the length of the lower portion of the plate **10** to restrain it against excessive deflection under load. Since the arcuate plate **10** is preferably sufficiently flexible to adapt itself to loads of various sizes, the rod **52** will serve as a limiting stop to prevent such excessive flexure of the plate that might result in leakage and accidental release of a load.

Whereas the material constituting the flap **16** and stops **22** and **24** is preferably air impervious, by its very nature, the gasket **12** having inter-connected cells is air pervious. The flap **16** is relatively thin and flexible and since it projects farther beyond the plate **10** than the gasket **18**, it will establish initial contact with the load, reducing undesired leakage to a minimum.

Whereas only one specific form of the invention has been described with reference to the accompanying draw-

ings, those variations that will suggest themselves to those skilled in the art are contemplated within the scope of the appended claims.

I claim:

1. A portable vacuum implement comprising a plate providing a work surface, a compressible resilient elastomeric sealing gasket having interconnected cells secured to said surface and defining therewith an open chamber, an air impervious resilient elastomeric flap having an edge secured peripherally to said gasket and a second edge anchored peripherally beyond said gasket, said flap and gasket defining a tubular passage, and means communicating with said chamber for exhausting the same.

2. A portable vacuum implement according to claim 1 including restraining means secured to said second edge and to said plate peripherally beyond said gasket.

3. A portable vacuum implement according to claim 2 wherein said restraining means is an air impervious elastomeric material.

4. A portable vacuum implement according to claim 1 including restraining elements free of said gasket secured to said plate on opposite sides of said gasket.

5. A portable vacuum implement according to claim 1 wherein a portion of said flap normally projects beyond said surface a distance greater than said gasket to establish initial contact with a load.

6. A portable vacuum implement according to claim 1 wherein said plate is arcuate.

7. A portable vacuum implement according to claim 1 wherein said plate is substantially cylindrical.

References Cited in the file of this patent

UNITED STATES PATENTS

2,578,220 Billner ..... Dec. 11, 1951