Oct. 8, 1968 B. F. NOSWORTHY 3,404,751

AERIAL BUCKET STEP

Filed Dec. 5, 1966

FIG. 1.

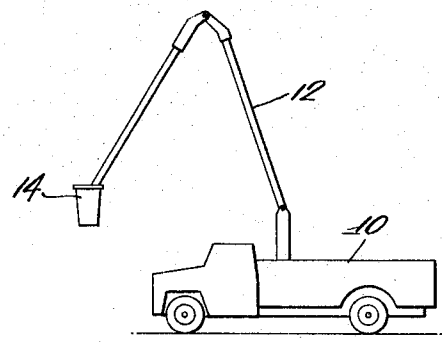


FIG. 2.

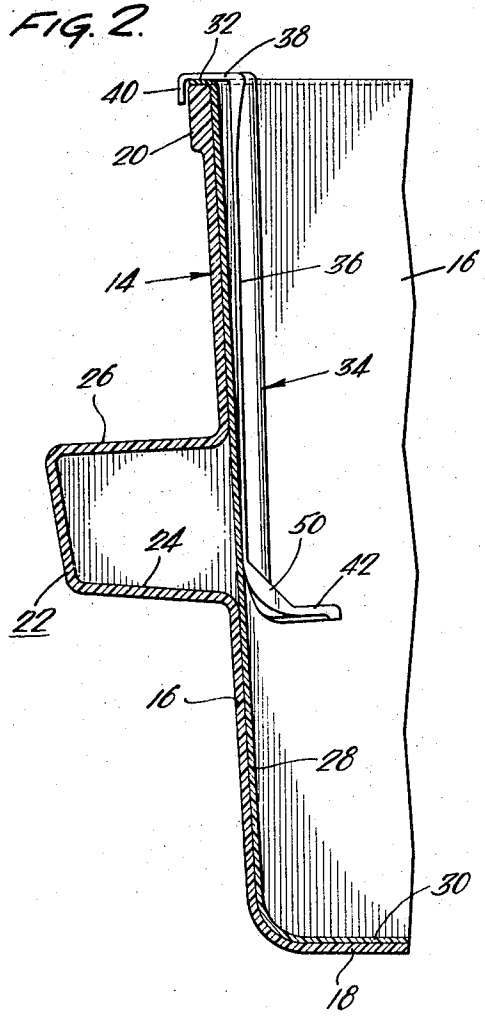


FIG. 3.

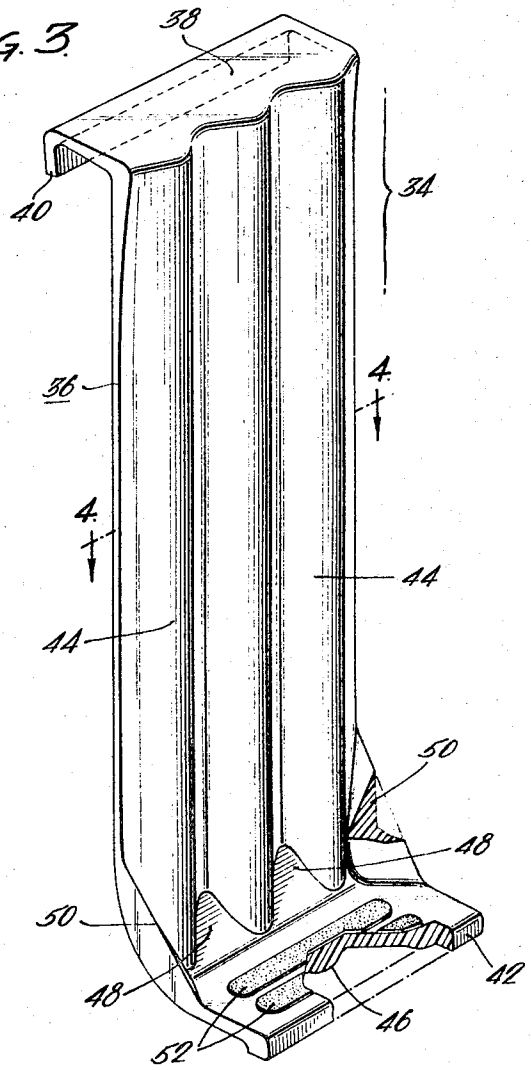
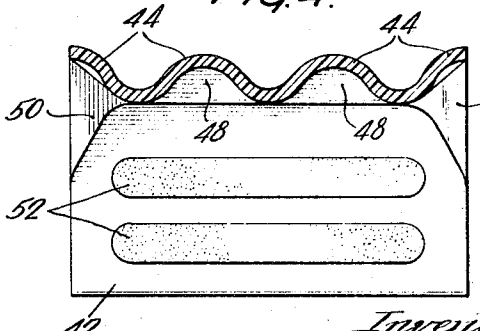


FIG. 4.



Inventor:
Bernard F. Nosworthy
by Howson & Howson
Attys.

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AERIAL BUCKET STEP

Bernard F. Nosworthy, 556 Colgate Ave., Johnstown, Pa. 15909

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ABSTRACT OF THE DISCLOSURE

A demountable step for an aerial bucket comprising a longitudinally extending panel having a flanged lid portion at the upper end thereof and a transversely extending step portion at the lower end thereof, said step being adapted for application to an aerial bucket with the flanged lip portion engaging the bucket top edge to facilitate entrance to or egress from the bucket.

In recent years, hydraulic articulated aerial beams having one or two buckets at the end thereof have largely replaced the ladder trucks formerly used for servicing electric poles, light standards, trees and the like. When utilized around power lines and especially high voltage wires, it is essential from a safety standpoint that the occupant of the bucket be completely insulated from the ground to avoid the danger of accidental current transmission through the occupant's body. For this reason, the buckets are conventionally made of molded fiberglass or similar non-conductive material and, in fact, in some instances, the bucket-supporting beams are made of non-conductive material, especially the outer beams which come close to the electric wires.

Despite the manufacturer's precautions in providing a basically non-conductive bucket structure, as a further safeguard it is a standard practice with many utility companies to employ a removable bucket liner of a non-conductive plastic material such as polyethylene which can be easily removed for periodic testing to confirm its dielectric properties. While similar tests could be performed on the bucket proper, the testing equipment normally cannot be reached by the bucket trucks, and it is a great deal simpler and faster to test only the bucket liners, defective liners being easily and cheaply replaced.

Since the buckets are conventionally waist high to provide support for a man leaning outwardly therefrom, it is difficult for a man to get in and out of the bucket when the bucket is on the ground, especially when burdened with heavy tools. While the more agile worker can push up with his hands and throw a leg over the bucket edge to enter or leave the bucket, this is a difficult task for the older, less agile, or burdened worker or one wearing heavy protective clothing and can lead to injury. In recognizing this, some bucket manufacturers have molded a step integrally into the side wall of the bucket, the step projecting outwardly from the side of the bucket and forming both an inner and outer step.

A problem arises, however, when the smooth walled plastic liner in inserted into the bucket since the integral bucket step, if present, is covered by the wall of the liner and hence cannot be used from inside the bucket. It is primarily for this purpose that the present detachable bucket step has been developed, the step by means of a flanged upper lip being adapted to fit over the top edge of the bucket providing both an interior or exterior bucket foothold as desired.

In view of the above it can be understood to be a first object of the present invention to provide a demountable bucket step for an aerial beam bucket which is adapted for use with integrally stepped buckets having non-conductive liners inserted therein or with buckets without integral steps.

A further object of the invention is to provide a demountable bucket step as described which may be conveniently and effectively employed on either the inside or the outside of a bucket.

Another object of the invention is to provide a bucket step as described of a simple, safe, lightweight design which may be economically manufactured of a non-conductive material.

Additional objects and advantages of the invention will be more readily apparent from the following detailed description of an embodiment thereof when taken together with the accompanying drawings in which:

FIG. 1 is a schematic plan view showing an aerial beam vehicle having a bucket of the type for which the present bucket step has been developed;

FIG. 2 is a partial sectional view of such a bucket provided with a plastic non-conductive liner and illustrating a bucket step in accordance with the present invention in position within the bucket;

FIG. 3 is a perspective view of the bucket step shown in FIG. 2, portions thereof being broken away to clarify construction details; and

FIG. 4 is an enlarged sectional view taken along line 4—4 of FIG. 3.

Referring to the drawings, FIG. 1 shows a truck **10** having a hydraulic articulated aerial beam **12** mounted thereon and including a bucket or basket **14** at the end of the beam, the bucket being designed for occupancy by a workman to reach normally inaccessible work areas such as light standards, electric poles and the like. This combination, which is commonly known as a "bucket truck", is schematically illustrated to show a typical type of bucket positioning apparatus, there being a number of different types available for the purpose of elevating or lowering a bucket to a remote position.

A partial sectional view of a bucket **14** of a type commonly employed in bucket trucks is set forth in FIG. 2. The bucket **14** which might for example be made of molded fiberglass reinforced plastic is typically characterized by four rectangularly disposed outwardly sloping side walls **16**, which are comolded along with the bottom **18** to form an integral one-piece bucket. A rail portion **20** around the peripheral edge of the bucket is conventionally provided of substantially heavier thickness to provide the desired stiffening of the bucket edge.

In one wall of the bucket an integrally molded outwardly disposed box-like step **22** may be provided for the above discussed purpose of facilitating entrance into and exit from the bucket, the lower inwardly accessible step surface **24** being employed by an occupant in the bucket to permit easier egress from the bucket while the upper outwardly accessible step surface **26** may be utilized from outside the bucket to gain entrance thereto. When a plastic non-conductive bucket liner **28** is utilized within the bucket as illustrated in FIG. 2, however, the comolded step **22** is sealed off by the liner, the straight walled liner cutting off access to the step surface **24**. The liner **28** is dimensioned to fit snugly within the bucket, the liner bottom **30** resting on the bottom **18** of the bucket with the flange **32** of the liner resting on the top edge of the bucket. Since the liner **28** must be removable for testing purposes and for replacement, and since there can be no apertures in the liner which would permit contact by the bucket occupant with the bucket proper, there is no manner in which the step surface **24** can be utilized with the liner present in the bucket. Until the development of the present invention, the occupant of a bucket equipped with a non-conductive liner in order to leave the bucket was forced to lift himself with his hands toward the bucket edge and throw a leg over the edge, a difficult and tiring

chore, especially for one weighted down with heavy tools and protective clothing as linemen most frequently are.

To provide an interior foothold under such circumstances and for other uses as described below, the present invention provides a detachable bucket step **34** comprising a vertical longitudinally extending panel member **36** having a transversely extending lip portion **38** at the upper end thereof which terminates in a downwardly directed flanged **40**. At the lower end of the longitudinallyq extending panel member **36**, a transverse step portion **42** extends substantially parallel to but opposed from the lip **38**.

As shown in FIG. 2, the step **34** may be demountably positioned with the lip portion **38** thereof extending over the top edge of the bucket and the liner flange **32** with the flange **40** extending downwardly along the outer edge of the bucket rail **20**, the longitudinal panel member **36** extending along the inner face of the bucket liner and the step portion **42** extending inwardly to provide a convenient foothold for the bucket occupant upon leaving the bucket. With the bucket illustrated in FIG. 2, the occupant may step first on the step portion **42** of the demountable step **34** with one foot and then step over the bucket edge and tread on the step surface **26** of the comolded bucket step **22** with the other foot prior to reaching the ground, at the same time gripping the upper edge of the bucket for support.

Although the present bucket step provides a convenient solution to the problem of climbing from a lined bucket, it may serve an equally important function in providing access to or egress from an unlined bucket which does not have a built-in step such as the step **22** of the illustrated bucket. For entering such a bucket, the step **34** is hung on the outside of the bucket with the lip portion **38** being directed inwardly and the flange **40** extending along the inner surface of the bucket wall, the step portion **42** extending outwardly from the bucket wall at a convenient height. To exit from such a bucket, the step is used in exactly the same manner as that illustrated in FIG. 2.

Although the present bucket step is intended to be mounted on the bucket only when the bucket is on the ground and to be removed from the bucket when the bucket is elevated into working position, it is nonetheless desirable that the step be made of a non-conducting material in the event that the step should accidentally be left in position during elevation of the bucket.

In the illustrated bucket step construction, the step is formed of fiberglass and has a breaking strength of 500 pounds, the step itself weighing a mere 3 pounds. Rigidity and strength are supplied to the step by forming the longitudinal panel member **36** in corrugations **44** as most clearly shown in the sectional view of FIG. 4. The underside of the step portion **42** is similarly strengthened by means of a corrugated undersurface **46** as shown in the cut away portion of FIG. 3.

Additional strength is provided to the transverse step **42** by the integrally molded sloping portions **48** between the corrugations **44** at the back of the step portion and by integrally molded step support ribs **50** along the back of the side edges of the step portion connected to the longitudinal panel **36**. Some type of non-skid surface such as the non-skid tape strips **52** is desirably applied to the upper surface of the step portion **42** to prevent slippage.

Although the step is preferably manufactured entirely of a non-conductive material and preferably of fiberglass, other types of non-conductive materials and particularly high strength plastics could also suitably be used. The step may also be made of metal, particularly if the step is intended for exclusive use in situations in which electrical wiring would not be encountered such as fruit picking or tree trimming operations.

A step of the type illustrated will normally be suited for any type of bucket, the only dimension which may have to be varied being the width of the lip **38**. In this respect, the step should properly fit the top edge of the bucket to prevent movement of the lip along the bucket edge when weight is applied to the step.

Although the corrugated shape of the longitudinal panel **36** is preferred for the molded fiberglass step, this member as well as the step portion **42** could, of course, be constructed of a flat panel or of a member having a different shape within the concept of the present invention.

Similarly, other changes in details of construction could be effected by those skilled in the art without departing from the spirit and the scope of the invention as defined in and limited solely by the appended claims.

I claim:

1. A demountable bucket step for an aerial bucket, the step being of integral one-piece construction and of substantially uniform width throughout its length and comprising a longitudinally extending member, a lip portion extending transversely from one end of said member and having a flange at the outer edge thereof, a step portion extending transversely from the other end of said longitudinal member in a direction opposite from that of said lip portion, said lip portion being adapted to extend over the top edge of the bucket when the bucket step is positioned with said member disposed along a wall of the bucket, said lip flange extending downwardly beyond the bucket top edge preventing transverse movement of the bucket step, said step portion providing a foothold for gaining entrance to or egress from the bucket, and support ribs at each side of said step portion connected to said longitudinal member to strengthen said step portion.

2. A bucket step as claimed in claim **1** wherein said longitudinal member comprises a panel having vertical currugations to add rigidity to said step.

3. A bucket step as claimed in claim **1** wherein said step is formed of a non-conducting material.

4. A bucket step as claimed in claim **3** wherein said bucket step is formed of molded fiberglass.

5. A bucket step as claimed in claim **1** wherein said step portion is provided with a non-skid surface.

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REINALDO P. MACHADO, *Primary Examiner.*