A tool bucket for hoisting items between two different vertical levels and a method for closing such bucket, the bucket including a bottom part including a base and one or more walls extending upwards from the base to substantially form a bucket, an upper part having a tubular shape made from a flexible textile or textile-like material, where the upper part is connected to the bottom part so that the upper part extends beyond an upper edge of the bottom part.
TOOLBUCKET AND A METHOD FOR CLOSING A TOOL BUCKET

TECHNICAL FIELD

[0001] The invention relates a tool bucket for hoisting items between two different vertical levels and a method for closing a tool bucket.

BACKGROUND

[0002] A tool bucket is a well known mean for hoisting tools and other items from one vertical level to another vertical level e.g. in connection with a scaffold at a building site, inside a wind turbine or other places where tools, manuals, building material, trash, fittings or other smaller and medium sized items have to be hoisted up or down between different vertical levels.

[0003] However, when the tool bucket is hoisted there is a potential risk of the bucket being caught in something on the way whereby the transported items can fall out of the bucket. This could of course cause damage to the dropped items but more importantly the falling items can be very dangerous if they hit a person based at a lower level e.g. the person hoisting the tool bucket by means of a rope and a suspended pulley.

[0004] From U.S. Patent application No. 2008/0308566 A1 it is therefore known to secure the transported items in a tool organizer provide on the sides of a rigid bucket part. However, such an organizer is complex and expensive and it will not secure tools placed in the bucket.

[0005] The invention therefore provides for advantageous technique for securing the items placed in the tool bucket at least during transportation between the different vertical levels.

[0006] Especially the invention provides an advantageous method for closing a tool bucket.

BRIEF SUMMARY

[0007] The invention provides for a tool bucket for hoisting items between two different vertical levels. The bucket comprises a bottom part including a base and one or more walls extending upwards from the base to substantially form a bucket, an upper part having a tubular shape and is made from a flexible textile or textile-like material, and wherein the upper part it connected to the bottom part so that the upper part extends beyond an upper edge of the bottom part.

[0008] By making the upper part from a flexible textile or textile-like material and making it extend beyond the upper edge of the bottom part it is possible to use the flexible quality of the upper part to close the tool bucket in a simple, efficient and durable manner.

[0009] It should be emphasised that by the term “textile or textile-like material” is to be understood any kind of cloth, woven or non-woven fabric, tarpaulin or tarp material or any combination thereof made of single filaments, formed as a uniform material, a uniform material reinforced by filaments or fibres or any other kind of textile or textile-like material made from plastic, leather, PVC, cotton, wool, canvas, nylon or any other material suitable for making a flexible upper part.

[0010] In an aspect of the invention, said upper part comprises two or more straps for being attached to hoisting means.

[0011] Providing the upper part with two or more straps enables that the tool bucket can be connected to hoisting means in a simple and efficient manner which at the same time will ensure that the upper part of the tool bucket is maintained closed or substantially closed during hoisting of the tool bucket.

[0012] In an aspect of the invention, said upper part comprises one or more tie lines for substantially tying said upper part.

[0013] A tie line is a simple and efficient way of closing the upper part of the tool bucket during vertical transportation of miscellaneous items and a tie line will at the same time provide for an advantageous attachment for hoisting means.

[0014] In an aspect of the invention, said upper part extends beyond said upper edge of said bottom part by between 50% and 400%, preferably between 60% and 300% and most preferred between 75% and 250% of the smallest cross sectional dimension of said bottom part at said upper edge.

[0015] If the upper part extends too long above the upper edge of the bottom part the upper part may hinder the filling of the bucket because it becomes more difficult to maintain the upper part in an substantially erect and an open state and if the upper part becomes too short the ability to use the upper part for closing the tool bucket is reduced. The present length ranges therefore provides for an advantageous relation between stability in open state and the ability to close the bucket securely.

[0016] In an aspect of the invention, said upper part comprises one or more load carrying means extending around the outside of said base.

[0017] Since the upper part is connected to the hoisting means and the items to be transported is placed in the bottom part the load of the bottom part and the enclosed items have to be transferred to the upper part. By making one or more load carrying means extending around the outside of the base of the bottom part the load can be transferred as pull loads in the load carrying means. This is highly advantageous in relation to transferring the entire load through connection means connecting the upper part with the bottom part in an overlap area.

[0018] In an aspect of the invention, said one or more load carrying means is arranged in one or more corresponding depressions in said bottom part.

[0019] The load carrying means are advantageously made from the same flexible textile or textile-like material as the upper part and even though the flexible qualities of this material is advantageous to make the load carrying means adapt to the outer surface of the bottom part is also makes it sensible to wear if the load carrying means are constantly placed between the bucket and the underlying ground. By arranging the load carrying means in one or more corresponding depressions in the bottom part the load carrying means are protected from direct wear which thereby increases the life of the load carrying means.

[0020] It should be emphasised that by the term “depression” is to be understood any kind of groove, channel, track, furrow or other “irregularity” in or in the surface of the bottom part suitable to obtain and protect one or more load carrying means.

[0021] In an aspect of the invention, said bottom part is made in a material that enables at least parts of said bottom part to be penetrated by light.

[0022] Making the bottom part in a material—such as white, light coloured or transparent plastic—which can be penetrated by light, is advantageous in that if the bottom part is penetrated by light it is easier to identify the different objects in the tool bucket.
In an aspect of the invention, said upper part overlap said bottom part to form an overlap area and wherein said upper part is connected to said bottom part in said overlap.

The bottom part is made in a solid and rigid material and the upper part is made in a flexible textile or textile-like material and it would be difficult to attach these two parts edge to edge. It is therefore advantageous to make the upper part overlap the bottom part to form an overlap area in which the upper part can be connected to the bottom part e.g. by means of adhesive, screws, bolts, rivets, stitching or other kind or connection means suitable for attaching the upper part to the bottom part.

In an aspect of the invention, said one or more walls of said bottom part extends upwards from said base by at least 50% of the largest cross sectional dimension of said base.

If the wall extends less than 50% of the largest cross sectional dimension of the base the wall becomes to short to support the items to be transported in the bucket and the items will press against the flexible upper part and reduce the stability of the buckets and increase the risk of the bucket being caught in something during the hoisting process.

In an aspect of the invention, the cross sectional area of said bottom part at said base is smaller than the cross sectional area of said bottom part at said upper edge.

By making the bottom part wider at the top than at the bottom—by making the bucket cone and/or making the walls taper—enables that the bucket can be filled and emptied more easily and it enables that the tool buckets can be stacked at least partially inside each other hereby reducing cost to transport and storage.

In an aspect of the invention, the cross sectional area of said bottom part at said base is between 0.001 m² and 1.5 m², preferably between 0.01 m² and 1.1 m² and most preferably between 0.05 and 0.8 m².

If the cross sectional area of the bottom part becomes too small the most common tools, folders and other item will not fit or at least not fit easily into the bucket and if it becomes too large the bucket becomes to heavy to hoist and it will increase the risk of the bucket being tangled up in something during the hoisting process.

In an aspect of the invention, said bottom part is made of a substantially rigid and dimensionally stable material.

Forming the bottom part in a substantially rigid and dimensionally stable material is advantageous in that this hard material will offer better protection to the transported item and in that it will make the tool bucket more durable and less prone to be tangled up in scaffolding or the like during the hoisting process.

In an aspect of the invention, said two or more straps extends beyond a free end of said upper part.

Making the straps extend beyond the free end of the upper part is advantageous in that it makes it easier to attach the straps to hoisting means and because it enables that the straps are accessible even if the upper part is rolled down to close the bucket.

In an aspect of the invention, said bottom part comprises a substantially uniform cross sectional shape from said base to said upper edge.

A bucket with a substantially uniform cross sectional shape from the base to the upper edge is easier to produce and less prone to be tangled up in anything during the hoisting process.

Furthermore, the invention provides for a method for closing a tool bucket according to any of the previously mentioned. The method comprises the steps of:

1. Rolling down the upper part at least one time from a free end and downwards so that at least one strap extends from either end of the rolled down part and bending or folding the rolled down part to bring the straps in proximity of each other, or
2. Tightening a tie line attached to the upper part.

Closing the tool bucket by utilizing the flexible quality of the upper part is advantageous in that a simple, inexpensive and durable method of closing a tool bucket is hereby provided.

In an aspect of the invention, said rolled down state of said upper part is maintained by maintaining said straps in proximity of each other by attaching said straps to the same hoisting means.

The tool bucket has to be connected to hoisting means anyway and attaching both straps to the hoisting means provides for a simple, inexpensive and durable method for maintaining the rolled down state of the upper part.

In an aspect of the invention, said tie line is maintained tight by attaching said tie line to hoisting means.

The tool bucket has to be connected to hoisting means anyway and attaching the hoisting means to the tie line provides for a simple, inexpensive and durable method for maintaining the closed state of the upper part.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described in the following with reference to the figures in which

FIG. 1 illustrates a vertical cross section of a first embodiment of a tool bucket, as seen from the front,

FIG. 2 illustrates a vertical cross section of a second embodiment of a tool bucket, as seen from the front,

FIG. 3 illustrates a tool bucket, as seen in perspective,

FIG. 4 illustrates the tool bucket shown in FIG. 3 with the upper part in a rolled down state, as seen from the front,

FIG. 5 illustrates the tool bucket shown in FIGS. 3 and 4 attached to hoisting means, as seen from the front,

FIG. 6 illustrates the embodiment of a tool bucket shown in FIGS. 3-5, as seen from the top, and

FIG. 7 illustrates a tool bucket with tie line closing means, as seen from the top.

DETAILED DESCRIPTION

FIG. 1A illustrates a vertical cross section down the middle of a first embodiment of a tool bucket, as seen from the front.

In this embodiment of the invention the tool bucket 1 comprises a bottom part 2 including a circular base 3 with a tubular wall 4 extending upwards from the base 3 until it ends at the upper edge 6 of the bottom part 2 whereby the bottom part is formed as a bucket. However the cross sectional shape of the bottom part 2 is not particularly important to the present invention and the bottom part 2 could just as well comprise a square, rectangular or polygonal shape.

In this embodiment the tool bucket 1 is provided with a tubular upper part 5 extending from somewhere around the middle of the side of the wall 4 of the bottom part 2 and upwards past the upper edge 6 of the bottom part 2 to end at
the free end 13. The upper part 5 overlaps parts of the outside of the bottom part 2 to form an overlap area 12. In this embodiment the overlap area is approximately half the height of the bottom part 2 but in another embodiment the overlap area 12 could extend shorter or longer or the extent of the overlap area 12 could vary around the bucket 1. In this embodiment the upper part 5 overlaps the outside of the bottom part 2 but in another embodiment the upper part 5 could overlap the inside surface of the bottom part 2.

[0056] In this embodiment of the invention the upper part 5 is connected to the bottom part 2 in the overlap area 12 by connection means 17 in the form of a plurality of rivets 17 distributed all around the overlap area 12. In another embodiment the upper part 5 and the bottom part 2 could be connected by means of screws, bolts, staples, adhesive, welding, stitching or any other type of connection means 17 suitable for connecting an upper part 5 to a bottom part 2 of a tool bucket 1 according to the present invention.

[0057] In this embodiment of the invention the bottom part 2 is made from moulded Polyester, but in another embodiment the bottom part 2 could be made from any other rigid and dimensionally stable material such as wood, metal, fibre reinforced resin, PVC or any other natural or artificial material suitable for the purpose.

[0058] The upper part 5 is in this embodiment of the invention made from a woven Polyester Flat PVC material but in another embodiment the upper part 5 could be made from any kind of solid, woven or non-woven material as long as it is a flexible textile or textile-like material.

[0059] In this embodiment of the invention the upper part 5 is provided with only two straps 7 for connecting the bucket 1 to hoisting means (not shown) but in another embodiment the upper part 5 could comprise another number of straps 7 such as one, three, four, six or more and in this embodiment the straps 7 are formed as two separate loops of the same material as the rest of the upper part 5 is made of and they are connected to the upper part 5 by means of stitching but in another embodiment the straps 7 could be formed as rings, eyes, hooks, snap hook or other means suitable for connecting the tool bucket 1 to hoisting means and in another embodiment the straps could be made from metal, any kind of fibre or fibre reinforced material or any other material suitable for making durable load carrying straps 7 or the straps 7 could be formed as integrated parts of the upper part 5.

[0060] It is important that the upper part 5 extents above the upper edge 6 of the bottom part 2 by a certain length. First of all to ensure that opposing edges at the free end 13 of the upper part 5 can reach each other and preferably overlap to ensure that the tool bucket 1 can be closed and secondly to ensure that the upper part 5 can be maintained in an open and erect state as illustrated in FIG. 1 during the emptying and filling of the bucket 1. E.g. if the upper part 5 is very flexible it will have to be relatively short to not collapse under its own weight or at the slightest touch.

[0061] In a further embodiment of the invention the upper part 5—e.g. in the overlap zone 12—could further be provided with external straps or handles (not shown) of a size making them suitable for carrying the tool bucket 1 by hand. The tool bucket 1 could also be provided for dedicated handles or holes in the upper part 5, the bottom part 2 or in both enabling that the tool bucket 1 can be carried by hand.

[0062] FIG. 2 illustrates a vertical cross section of a second embodiment of a tool bucket 1, as seen from the front.

[0063] In this embodiment of the invention the tool bucket 1 is provided with load carrying means 10 in the form of a belt extending around the outside of the bottom part 2 i.e. around the outside of the base 3 of the bottom part 2. The function of load carrying means 10 is to transfer at least some of the load of the tool bucket 1 directly to the hoisting means (not shown) lifting the bucket 1. In this embodiment this is achieved by forming the load carrying means 10 integrally with the straps 7 whereby substantially all the load of the bottom part 2 and its content is carried by the load carrying means 10, and via the straps 7, transferred to the hoisting means (not shown). Hereby the load of the bottom part 2 and its content is transferred to the hoisting means without stressing the connection means 17 connecting the bottom part 2 with the upper part 5. This is advantageous in that potentially harmful shear forces between the bottom part 2 and the upper part 5 is hereby avoided or reduced.

[0064] In another embodiment of the invention the load carrying means 10 could be formed separate from the straps 7 and/or the upper part 5 and the load carrying means 10 could be formed as a web, as strings, wires or other means suitable for extending around the base 3 and transferring at least some of the load of the bucket to the hoisting means and thereby reduce shear forces between the bottom part 2 and the upper part 5.

[0065] Since the load of the bucket 1 is primarily transferred to the hoisting means (not shown) in the form of tensile load in the load carrying means 10 it is important to protect the load carrying means 10 from other kinds of load or wear to ensure the life of the load carrying means 10 and reduce the risk of the load carrying means 10 braking during use hereby causing the bucket 1 to break down during use and potentially harm personnel of material.

[0066] In this embodiment of the invention this is done by arranging the load carrying means 10 in a corresponding depression 11 in the bottom part 2. Hereby is the load carrying means 10 protected by direct wear every time the bucket 1 is placed on an underlying surface.

[0067] In this embodiment the depressions are formed with the bottom part 2 during the moulding of the bottom part 2 but in another embodiment the depressions could be formed by subsequent pressing, machining or other.

[0068] FIG. 3 illustrates the tool bucket 1 shown in FIG. 2, as seen in perspective.

[0069] In this embodiment of the invention the upper part 5 comprises two load carrying means 10 arranged perpendicularly to each other extending around the outside of the base 3 in corresponding depressions 11 in the bottom part 2. However in this embodiment only one of the load carrying means 10 is formed integrally with the straps 7. The other load carrying mean 10 ends blind at the free end 13 of the upper part 5.

[0070] In this embodiment the load carrying means 10 are not connected to the bottom part 2 but are instead merely “enclosed” in the depression 11 and in this embodiment the load carrying means 10 are connected to the upper part 5 by means of stitching. But in another embodiment of the invention the load carrying means 10 could be connected to the upper part 5 and/or the bottom part 2 by means of welding, adhesive, screws, bolts, stitching, rivets, staples or any combination thereof.

[0071] FIG. 4 illustrates the tool bucket 1 shown in FIG. 3 with the upper part 5 in a rolled down state, as seen from the front.
In this embodiment of the invention the tool bucket 1 is closed—after being filled with items to be transported between different vertical levels—by the operator manually grabbing the two straps 7 and rolling down the upper part 5 from the free end 13 and downwards at least one time but preferably two, three or more times to ensure that the bucket 1 remains closed during the hoisting process.

FIG. 5 illustrates the tool bucket 1 shown in FIGS. 3 and 4 attached to hoisting means 8, as seen from the front. After the free end 13 of the upper part 5 has been rolled down a number of times the two straps 7 are brought in proximity of each other and connected to the same hoisting mean 8 to ensure that the upper part remains in the rolled down state during the entire hoisting process i.e. as long as the straps are connected to the hoisting means 8.

In this embodiment of the invention the hoisting means 8 is a lifting hook but in another embodiment the tool bucket 1 could be attached to hoisting means 8 in the form of a shackle, a snap hook or any other means suitable for attaching tool buckets to a hoisting line or the tool bucket 1 could be attached to the hoisting line by means or one or more knots on the hoisting line which could be a rope, a chain, a wire or other.

FIG. 6 illustrates the embodiment of a tool bucket 1 shown in FIGS. 3-5, as seen from the top.

In this embodiment of the invention the bottom part 2 is square which along with a slightly rectangular shape is advantageous over e.g. a circular or oval shape in that folder, manuls, boxes of building material etc. can be arranged more efficiently in a square or rectangular bucket 1 because of the above mentioned item's square or rectangular shape.

In this embodiment the bottom part 2 comprises sharp edges both between the four walls 4 and between the walls 4 and the base 3 but in a preferred embodiment of the invention the corners between the walls 4 is rounded and in another embodiment the corners between the walls 4 and the base 3 could also be rounded.

FIG. 7 illustrates a tool bucket 1 with tie line 9 closing means, as seen from the top.

In this embodiment the bucket 1 can be closed by means of tie line 9 running endlessly in and out of holes in the upper part 5. If the tie line 9 is pulled in one or more places the edges of the upper part 5 at the free end 13 will be forced together and thereby close the bucket 1 at least to a degree which will prevent the content of the bucket 1 from falling out of the bucket 1 if the bucket 1 runs into obstacles during the hoisting process.

Preferably the hoisting means (not shown) is attached to the tie line 9 in one or e.g. two opposing placed and as soon as the hoisting process is initiated the hoisting means combined with the gravitational pull in the bucket 1 will tighten the tie line 9 and thereby close the bucket 1 and this closed state will inherently be maintained during the entire hoisting process.

In this embodiment the tie line 9 is provided in holes in the upper part 5 provided with hole reinforcements 16 but in another embodiment the tie line could be provided through dedicated straps e.g. straps similar to the straps 7 disclosed in FIG. 1-6.

In this embodiment of the invention the tie line 9 is a heavy fiber reinforced cotton string but in another embodiment of the invention the tie line 9 could be a metal wire or chain or any kind of rope or cord made from any kind of durable and suitable material such as cotton, Polyester, Car-
14. A method according to claim 13, wherein said rolled down state of said upper part is maintained by maintaining said straps in proximity of each other by attaching said straps to the same hoist.

15. A method according to claim 13, wherein said tie line is maintained tight by attaching said tie line to a hoist.

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