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S. R. BERGMAN

1,979,953

CENTRIFUGE BUCKET

Filed July 13, 1932

Fig. 1.

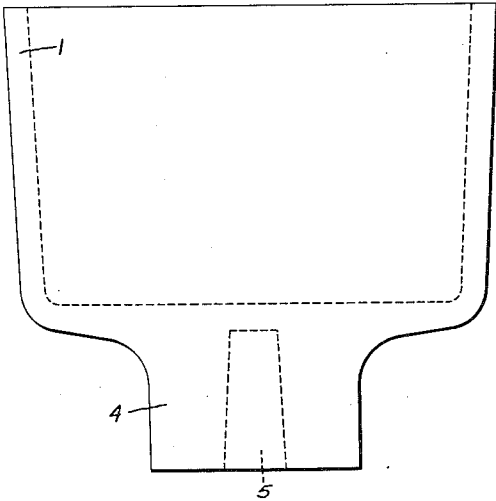


Fig. 2.

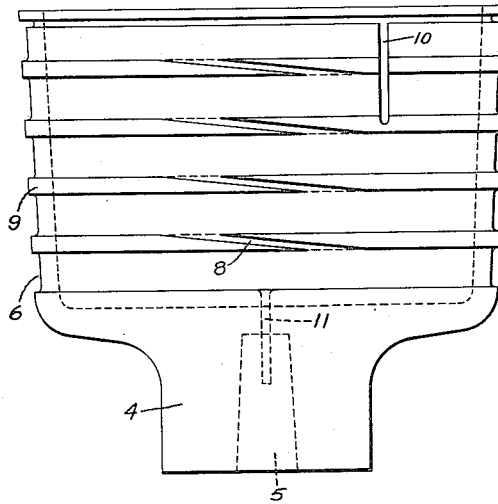


Fig. 3.

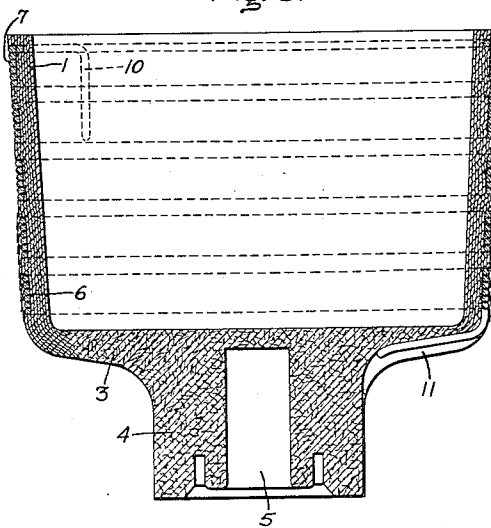


Fig. 4.

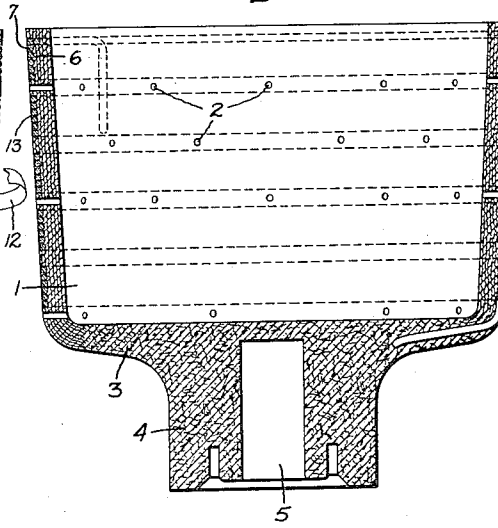
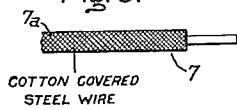


Fig. 5.



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UNITED STATES PATENT OFFICE

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CENTRIFUGE BUCKET

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Application July 13, 1932, Serial No. 622,272

5 Claims. (Cl. 118—49)

The present invention relates to centrifuge buckets such as are used in the spinning of rayon.

One object of my invention is to provide an improved construction and arrangement of bucket wherein the bucket is reinforced with metal in a manner such that it is capable of operating efficiently at high speeds and at the same time is not affected adversely by the acid solution to which it is subjected.

A further object of my invention is to provide an improved method of manufacturing such a bucket.

For a consideration of what I believe to be novel and my invention, attention is directed to the following specification and the claims appended thereto.

In the drawing, Fig. 1 is a side elevation of a preform used in constructing a bucket embodying my invention; Fig. 2 is a side elevation illustrating further steps which are utilized in carrying out my invention; Fig. 3 is a vertical sectional view showing additional steps used in carrying out my invention; Fig. 4 is a sectional view of a completed bucket, and Fig. 5 is a detailed view.

Referring to the drawing, Fig. 4, which shows a completed bucket embodying my invention, 1 indicates the side wall provided with circumferentially extending rings of spaced holes 2 for the escape of acid, 3 indicates the bottom wall, and 4 indicates the hub provided with opening 5 to receive the driving spindle. The rows of holes 2 are spaced apart a suitable distance and between such rows, side wall 1 is provided with shallow circumferentially extending grooves 6 in which is wound reinforcing wire 7. Grooves 6 are preferably connected to each other by angularly extending slots 8 as shown in Fig. 2 so that the reinforcing wire 7 may be one continuous wire extending from top to bottom of side wall 1.

The bucket is constructed from an acid resisting moldable material. As a moldable material, I utilize preferably spinnable textile fibres, for example woven or unwoven cotton impregnated with and held in a highly compressed state by an artificial resin such as a phenolic condensation product. The side walls may be constructed from woven cotton duck united by artificial resin while the bottom wall and hub, in which the stresses are not so high, may be constructed from unwoven cotton united by an artificial resin or from small pieces of woven cotton cloth (for example, pieces of scrap material) united by an artificial resin. An artificial resin, such as a phenolic con-

densation product, is acid resisting and forms a covering which protects the cotton fibres from the acid.

To protect the wire from the acid and to form a bond between it and the side wall 1, I utilize wire provided with a wrapping 7^a of acid resisting material which forms a bond with side wall 1. For this purpose, I use preferably cotton covered wire wherein the cotton covering is impregnated with artificial resin. I have found steel wire having a quadruple cotton covering to be satisfactory. During the molding operation, the artificial resin integrally unites the coverings on successive turns of wire with each other and with side wall 1, thus forming a unitary structure. This is a feature of my invention which I regard as being important since by this arrangement, if one or more turns of wire become broken, it does not affect appreciably the strength of the wire reinforcement for by the arrangement described, each turn becomes in substance independent of the other turns in so far as its function of reinforcing is concerned. The arrangement has the advantage also that it makes the holding in place of the turns of wire independent of the anchoring of the ends of the wire.

In constructing a bucket according to my invention, I first take the moldable material from which the bucket is to be constructed and make a preform as shown in Fig. 1, which has the general contour of the completed bucket. The side walls 1 may be constructed from successive layers of woven cotton duck and may be formed by winding a strip of cotton duck of suitable width on a mandrel, the duck having been treated before winding with the artificial resin. The preform is constructed by placing the moldable material in a suitable mold and giving it an initial pressing at a suitable temperature to cause it to take the desired shape and adhere together, the operation being such as not to completely cure the moldable material. The preform is then taken from the mold and the grooves 6 and slots 8 are cut therein, there being left between the grooves the lands 9 in which the openings 2 are to be formed. At this time, I form also grooves 10 and 11 which receive the ends of the reinforcing wire. I next take wire which is to form the reinforcement, it being in the illustrated embodiment of my invention a wire having a cotton covering which has been treated with artificial resin and dried, place one end in the groove 10, and wrap the wire under suitable tension in the grooves 6, the successive turns of the wire being in close engagement with each other and the wire passing

from groove to groove through the slots 8. After the wrapping of the wire is completed, the end is positioned in the lower groove 11 as shown in Fig. 3. I next place a suitable amount of molding material in the grooves 10 and 11 so as to cover the ends of the wire, after which, the structure is placed in a suitable mold (which may be the mold used in making the preform) and the moldable material is cured under heat and pressure. The method of molding material of this type is well known in the art and requires no detailed description. When finished, the bucket is smooth on the outside and the steel wire is completely protected by the acid resisting covering.

It is important that a bucket of this type be as smooth on the outside as possible and to improve the bucket in this respect, I may provide on the outside of the bucket a special wrapping of thin woven cloth such as thin tape. For example, I have found cotton tape of a thickness of the order of 0.007 of an inch satisfactory. The tape is first treated with the adhesive, such as an artificial resin, after which it is wound on the outside of the bucket, successive turns overlapping, it being applied after the wire is wound on and before the final molding operation. The tape in process of being wound, is indicated at 12 in Fig. 3, it being wound so that successive layers overlap about one-half their width. The bucket is then given the final molding operation and when completed, the tape provides a thin integral covering which is very smooth on the outer surface. In the finished bucket, Fig. 4, the tape covering is indicated at 13.

In connection with my improved construction, it is to be noted that the reinforcing wire is not embedded in the body of the bucket but is wound on the outer surface thereof. This is an important consideration because by locating the wire on the surface, the maximum reinforcing effect is obtained. The winding of the wire on the outer surface is made possible by reason of the fact that the wire is covered with the acid resisting coating and, as pointed out above, the fact that this acid resisting coating adheres to the material of the side wall adds greatly to the reliability of the structure since if one or more turns of wire become broken, the other turns are not affected and the strength of the structure is not appreciably decreased.

The method disclosed in this application is not claimed herein as it forms the subject matter of my divisional application Serial No. 694,979, filed October 24, 1933.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. A centrifuge bucket comprising non-metallic side walls of acid resisting material, and a metallic reinforcing member wound on the outer surface of said side walls, the turns of said member being covered with acid resisting material which is integrally united to the material of the side walls.

2. A centrifuge bucket comprising non-metallic side walls of acid resisting material, and a continuous metallic reinforcing member wound on the outer surface of said side walls, the turns of said member being covered with acid resisting material which is integrally united to the material of the side walls, and turns being spaced apart at intervals to provide spaces having openings therein for the escape of acid.

3. A centrifuge bucket comprising side walls formed from textile fibres united by an artificial resin, and reinforcing means for the side walls comprising turns of wire on the outer surface of the side walls, the turns being covered with textile fibres united and joined to the side walls by artificial resin.

4. A centrifuge bucket comprising non-metallic side walls of acid resisting material, a metallic reinforcing member wound on the outer surface of said side walls, the turns of said member being covered with acid resisting material which is integrally united to the material of the side walls, and a thin covering of woven fabric on the outer surface of the bucket to give it a smooth finish.

5. A centrifuge bucket comprising side walls formed from textile fibres united by an artificial resin, reinforcing means for the side walls comprising turns of wire on the outer surface of the side walls, the turns being covered with textile fibres united and joined to the side walls by artificial resin, and a thin covering of woven textile material on the outer surface of the bucket united therewith by artificial resin.

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