(No Model.)

W. F. AUGUSTIN.

REINFORCED SEAM FOR RUBBER GOODS.

No. 601,421. Patented Mar. 29, 1898.

Fig-1

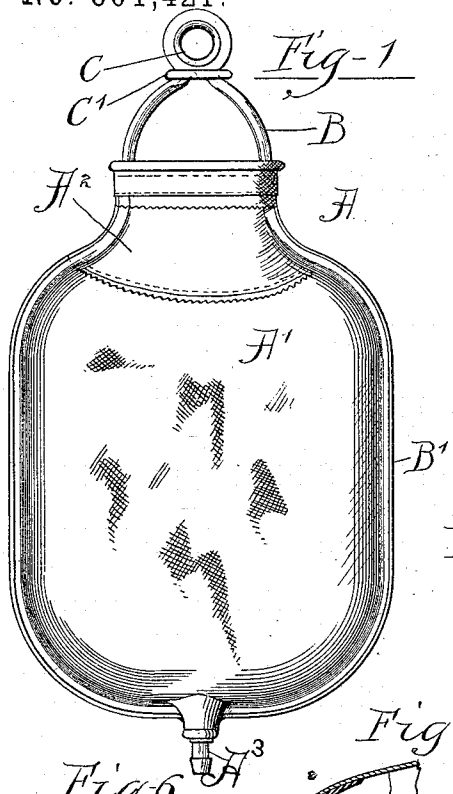


Fig 3

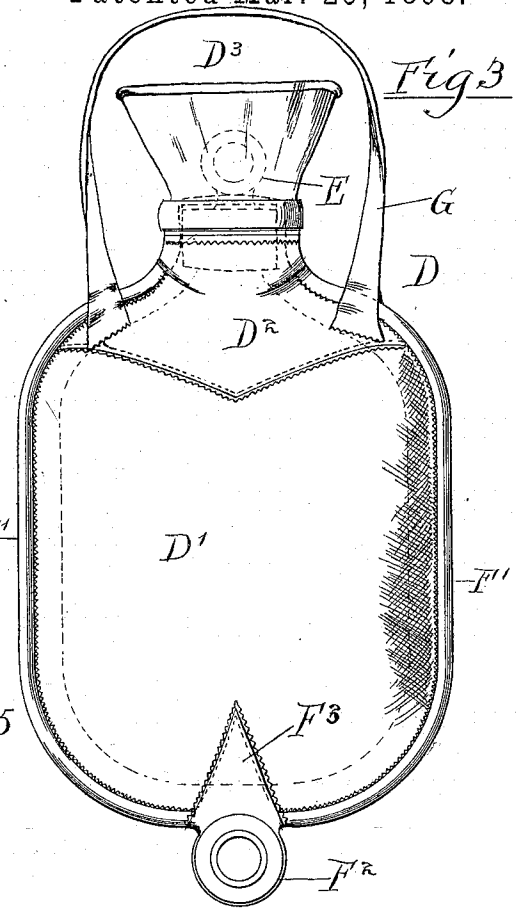


Fig-5

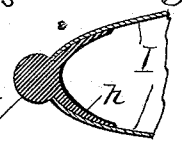


Fig-6

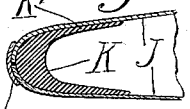


Fig-2

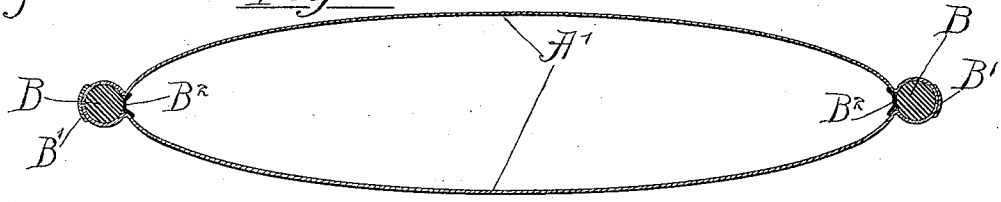
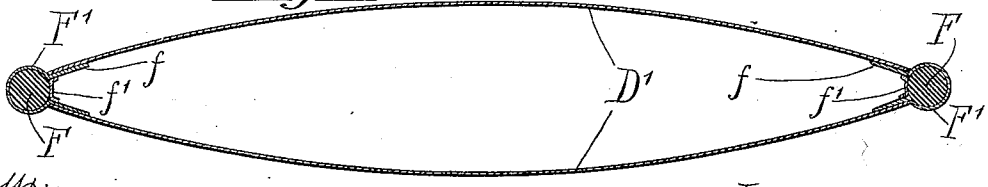


Fig 4



Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM FRANCIS AUGUSTIN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO FRANCIS E. AUGUSTIN, OF SAME PLACE.

REINFORCED SEAM FOR RUBBER GOODS.

SPECIFICATION forming part of Letters Patent No. 601,421, dated March 29, 1898.

Application filed March 15, 1897. Serial No. 627,611. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FRANCIS AUGUSTIN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Reinforced Seams for Rubber Goods; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved means of reinforcing seams of rubber receptacles or the like, where two edges are brought together and secured upon each other by adhesion to form a water or air tight seam.

The invention is herein shown as applied to a hot-water bottle or to the head of a fountain-syringe; but, as will hereinafter more fully appear, the invention may be applied wherever it is desired to make a water or air tight seam in rubber receptacles.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 illustrates my invention as embodied in a fountain-syringe head. Fig. 2 is an enlarged cross-section of the same. Fig. 3 shows a hot-water bottle embodying my invention in another form. Fig. 4 is an enlarged cross-section of Fig. 3. Fig. 5 is a fragmentary detail of another form of the invention. Fig. 6 is a fragmentary detail of still another form of the invention.

It has heretofore been common in the construction of rubber air or water receptacles to join the meeting edges together and to secure over the same, either on the outside or both on the inside and outside thereof, suitable strips, preferably of the same material as the material of which the receptacle is made, which strips are of sufficient width to overlap the adjacent edges of the side members and which are secured to said side members by adhesion. Such articles when made of rubber are commonly manufactured before the rubber has been vulcanized and when it is in a soft pasty state. When the parts are brought together, as described, they will adhere together, and when put into the oven and vulcanized to the required degree said parts will be permanently secured upon each other, as is well known.

The seams formed in the manner above stated are for a time effective as air or water tight joints; but it has been found that after continued use such seams become broken and allow the escape of the contained air or water. This is the result of various causes. Such receptacles are made of very flexible material and when folded upon themselves tend to remain in their folded position, the additional thickness of the securing-strip upon the edges thereof giving a slight stiffness thereto, but not sufficient to maintain the same in its normal or unfolded position. The consequence is that when a bag remains in its folded position for some time the seams become set in such position, forming folds or kinks therein, and when brought again to their normal unfolded position said seams are liable to become broken or the inside and outside binding-strips to become torn from the main side members thereof. It is a well-known fact, however, that in hot-water bottles the material thereof becomes hardened by the heat from the water and consequently becomes less elastic, and the seams are liable to become broken when the bottle is folded upon itself or unfolded after having been folded for some time, owing to the additional thickness thereof. Another defect of such construction in hot-water bottles or the like is that the bottles when filled with water and suspended by the handle or bail, the weight of the water is brought almost wholly upon that portion of the bag to which the said bail is attached, and the construction of the seam being such as not to strengthen the same this portion of the bottle soon becomes broken. The seams at the lower end of the bottle are also found to soon give way. To overcome this defect, I propose to reinforce the seams at the meeting edges of the side members of the bag by means of a strand or cord of any suitable somewhat flexible material. Said reinforcing-strand will preferably be continuous throughout the length of the seam extending from one end of the bottle around the edges thereof and back to the starting-point, and will in practice be placed either upon the inside or upon the outside, as desired. Said strand will be made of a material to give suitable stiffness or rigidity thereto while somewhat flexible or elastic, as before stated, which will prevent the bottle from lying in a folded po-

sition, but will tend to maintain it flat when empty. In case the strand is made of a metal it will be desirable to provide it with a cover of some suitable material, by means of which it will readily adhere to the meeting edges of the sides of the bottle when in place.

Means for suspending the bottle will be either made integral or secured directly upon the strands at the upper end of the bottle, so that when the same is filled with water or the like the weight thereof will be evenly distributed thoughout the bottle, owing to the continuous reinforcing-strand and its attachment to the side members thereof. An additional advantage of such reinforcing-strand is that the adhering surfaces of the side members of the bottle are increased, so that greater strength is given to the seam than could be secured in the construction before set forth.

First describing the construction shown in Figs. 1 and 2 of the drawings, A designates as a whole a bottle or head of a fountain-syringe comprising two side members A′ A′, of suitable elastic material, such as rubber. Said side members are herein shown as made of slightly-greater width than the width of the finished bottle. A^2 designates the upper end or neck of the bottle, which is formed at its extreme upper end into a suitable mouth, by means of which said bottle may be filled, and the lower end is provided with a suitable nozzle A^3, to which the usual hose or tube (not shown) will be attached, by means of which the water may be carried to any desired point of application. B designates a continuous reinforcing-strand secured between the meeting edges of said side members A′ and by means of which the seam formed thereby is reinforced and strengthened. Said seam is herein shown as formed by securing the side members upon the opposite sides of the reinforcing-strand B, the edges of said side members meeting on the outside of the strand. A binding-strip B′ is secured upon the outer meeting edges of said members A′, by means of which said members are additionally secured together and a finish is given to the seam. As an additional means of securing the side members together and for the purpose also of providing perfect water or air tight joints, an inner binding-strip B^2 is secured upon the inner surface of the reinforcing-strand B and the adjacent members of the side members A′ inside of said strand. As will be seen, a much greater adhesive surface is provided at the edges of the side members and between the same and the strand B than in the prior construction, which, in the bottle shown in Figs. 1 and 2, is approximately equal to one-half of the circumference of said reinforcing-strand and which will obviously give greater strength to the seam to resist strain brought thereon. In the construction shown in Fig. 1 said reinforcing-strand extends from the nozzle A^3 to the upper end, where it is formed into a suitable bail, by means of which it may be suspended, and is returned on the opposite edge of the bottle to its starting-point adjacent the nozzle A^3. Preferably and as herein shown a ring C is secured on the upper end of the bail by a clamping-ring C′, by means of which the bottle may be suspended from a suitable hook. The material forming the reinforcing-strand will preferably possess sufficient rigidity and elasticity to maintain the mouth of the bag distended or in its open position, as shown in Fig. 1. When said strand is made of rubber, it will usually be vulcanized slightly more on the side members A′ to give it the required stiffness. Such property of the strand will obviously tend to maintain the bottle in its flat or unfolded position when empty, notwithstanding the fact that the side pieces are of very flexible material, as usual in such articles. It will also be seen that when the bag is filled with water and suspended the weight of the water will be distributed equally throughout the same, as the strand takes up the weight thereof, and owing to the larger bearing-surface of said side members on said strand the seam will not thereby be broken.

In Figs. 3 and 4 is shown a slightly-modified form of reinforcement for the seams, which form is shown as embodied in an ordinary hot-water bottle. In said figures, D designates the bottle as a whole, comprising the side members D′, which are in this instance made of slightly less width than the width of the finished bottle. The neck of the bottle D^2 is formed at the top thereof in a suitable mouth, through which the same may be filled. In the present instance an integral funnel-shaped mouthpiece is shown, and the bottle is sealed to make it water-tight by means of a screw-threaded plug E′. (Shown in dotted lines in Fig. 1.)

The reinforcing-strand F of the bottle shown in Figs. 3 and 4 is placed upon the outside of the meeting edges of the side members thereof, and said side members do not have direct connection therewith. In this construction said strand is provided on the outside thereof with a covering F′ of a width greater than the circumference of the same and which is secured upon the strand with the opposite free edges projecting inwardly at an angle from each other, forming arms *f*, by means of which the side members D′ are secured thereto. Said covering F′ will preferably be made of the same material as the side members D′. The arms *f* diverge from each other, as shown in Fig. 4, and the side members are secured upon the outer surface thereof. Said arms are of a length to provide sufficient bearing to said members D′ thereof to thereby give the required strength to the seam. A filling-strip *f*′ is secured upon the inside of the reinforcing-strand F and to the adjacent arms *f*, thereby additionally securing the arms together and giving greater strength to the seam. Said reinforcing-strand F is shown in Fig. 3 as made of a continuous cord and as extending from the base of the

neck D^3 around the outer edges of the bottle and back to the opposite side of the neck. A suitable ring F^2 is attached at the lower end of the bottle for the purpose of facilitating the handling of the same and is secured thereto by means of securing-flaps F^3 in a familiar manner. As an additional means of handling the bottle a flexible bail or loop G is secured to the strand and side members at the upper end of the bottle. Said bail will usually be made of rubber and secured to the strand and adjacent surface of the side members as the seams are formed. The attachment of the bail directly to the reinforcing-strand prevents the breaking of the same, as the weight of the bottle is more evenly distributed throughout the same.

In Fig. 5 is shown a further modification which is similar to the construction shown in Figs. 3 and 4 just described. Instead of providing the reinforcing-strand H in said construction with a covering having inwardly-projecting divergent arms said strand is, in Fig. 5, shown as provided with integral inwardly-extending arms *h*, to which the said members I of the bar are adapted to be secured in a manner similar to that shown in Fig. 4. In the construction shown in Fig. 5 the arms H may possess considerable rigidity, so that the side members I will tend to stand away from each other when the bottle is empty. The strand H will usually be made of the same material as the side members and will be vulcanized at the same time. If desirable to give additional rigidity, said strand may be previously vulcanized to a given extent.

In Fig. 6 is shown still another modification. In this construction the strand K is formed with integral arms K′, as in the construction shown in Fig. 5; but the side members of the bottle are adapted to inclose the same and meet on the outside thereof, as in the construction shown in Figs. 1 and 2, and the meeting edges will be covered by a securing-strip J′. The arms to which the side members J are attached do not diverge, as shown in Fig. 5, but extend parallel with each other and are of a length to give sufficient bearing to said side members. As in said Fig. 5, they possess some rigidity, and the parts are secured together as in the previously-described construction.

As before stated, said improvement may be applied as well to air-cushions or the like as to water-bottles, as herein shown, or whereever a water or air tight seam is made by securing the members thereof together by adhesion.

Although the reinforcing-strands are shown as cylindric in form, it will be understood that they may be made of any desired cross-section.

I claim as my invention—

1. In a receptacle made from flexible material, the combination with the side members thereof which are adapted to be secured together at their opposite edges, of a continuous reinforcing-strand located between the meeting edges thereof and extending around the outer edges of the receptacle, said side members being secured to the opposite sides of the strand by adhesion to thereby form water and air tight joints.

2. In a receptacle made from flexible material, the combination with the side members thereof which are adapted to be secured together at their edges, of a continuous reinforcing-strand located between the meeting edges thereof and extending around the outer edges of the receptacle, and a filling-strip secured to the inner side of the strand and the adjacent walls of the side members, said side members being secured to the opposite sides of the strand by adhesion to thereby form water and air tight joints.

3. In a receptacle made from flexible material, the combination with the side members thereof which are adapted to be secured together at their edges, of a reinforcing-strand located between the meeting edges of said side members and to which said members are secured by adhesion, said strand being continuous and extending around the edges of the receptacle and forming at one end thereof means by which the receptacle may be handled.

4. In a receptacle made from flexible material, the combination with the side members thereof adapted to be secured at their edges by a flexible reinforcing-strip of greater relative rigidity than said side members and located between said members, said strand being provided with inwardly-extending arms to which the said members are secured.

5. In a receptacle made from flexible material, the combination with the side members thereof adapted to be secured together at their edges, of a flexible reinforcing-strip between said members provided with integral inwardly-extending arms to which said side members are secured by adhesion; said strip having greater relative rigidity than the side members to which it is attached.

6. In a receptacle made from flexible material, the combination with the side members thereof adapted to be secured together at their edges, of a flexible reinforcing-strip located between said meeting edges of greater relative rigidity than said side members and provided with inwardly-extending arms to which said members are secured by adhesion, said side members meeting on the outside of said strand and a strip secured over said meeting edges.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 11th day of March, A. D. 1897.

WILLIAM FRANCIS AUGUSTIN.

Witnesses:
TAYLOR E. BROWN,
WILLIAM I. HALL.