(No Model.)

J. A. KNIGHT.

SEAMLESS WOVEN BAG.

No. 592,057. Patented Oct. 19, 1897.

Fig. 1.

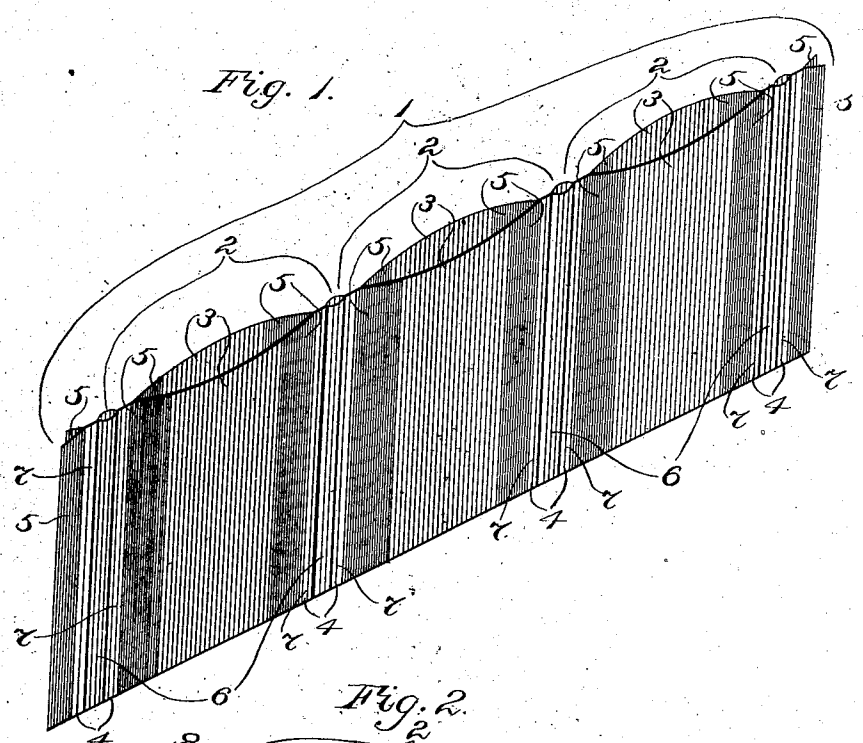
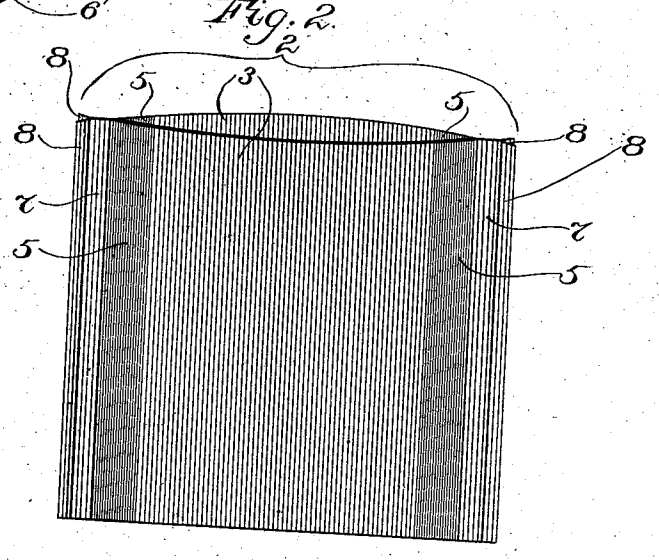


Fig. 2.



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UNITED STATES PATENT OFFICE.

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SEAMLESS WOVEN BAG.

SPECIFICATION forming part of Letters Patent No. 592,057, dated October 19, 1897.

Application filed May 26, 1897. Serial No. 638,221. (No model.)

To all whom it may concern:

Be it known that I, JESSE A. KNIGHT, a citizen of the United States, residing at Phenix, in the county of Kent and State of Rhode Island, have invented certain new and useful Improvements in Seamless Woven Bags, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to that mode of producing seamless woven bags in which a continuous bag-web is produced, the said bag-web being formed in two superimposed plies, which form the sides of the bag, and the said plies being interwoven along the required lines or bands for the purpose of uniting the two sides of each bag where necessary, the bags subsequently being separated by tearing or cutting across the bag-web along the middle lines of the bands of interweaving aforesaid, where such bands intervene between adjacent bags.

The invention consists in a continuous bag-web and in a seamless woven bag, both of novel and improved character and construction, and all as will be described first with reference to the accompanying drawings, and afterward will be particularly pointed out and distinctly defined in the claims at the close of this specification.

Figure 1 of the said drawings is a perspective of portion of a bag-web constructed in accordance with my invention, and Fig. 2 shows a single bag detached.

1, Fig. 1, represents a portion of a continuous bag-web.

2 2 2 designate the respective bags, one bag being represented detached in Fig. 2. 3 3 are the two plies or cloths constituting the opposite sides of the said bags, these plies or cloths being joined along one edge of the web to close the bottoms of the bags, and being left separate along the other edge thereof to form the openings or mouths.

4 4 are the bands in which the two plies are interwoven or united at intervals to join them together for the purpose of forming the side edges of the respective bags.

It is found in practice that in the weaving of bag-webs as described above differences will occur in the lengths of the two plies which constitute the two sides of a given bag. For various reasons it commonly occurs in the weaving that one ply or the other will be slightly longer than the other, measured in the direction of the length of the bag-web—that is to say, in the direction of the length of the warp—and hence it occurs that when the two plies are interwoven to form the uniting-band or seam an opening is produced at the junction between the said uniting-band and the ply which has been formed shorter than the other ply, as stated above. In this opening there will be found only the warp-threads of one ply and there will be an absence of the filling or weft, which makes a weak seam or joint. One portion of the invention has for its aim to remedy this defect and obviate the existence of openings as aforesaid and to render the two plies of a seamless woven bag denser, firmer, and stronger at and adjacent to their union in the uniting-band; in other words, to reinforce the said plies at and adjacent to the place at which they are interwoven with each other, and also aid in preventing the formation of openings.

I will explain with reference to the said portion of my invention as follows: Let it be assumed that the weaving of a bag-web has proceeded until the two separated plies which constitute the sides of a given bag have been given approximately the full intended width thereof. Now, just before beginning to join the two plies or cloths, I reduce either the feed of the warp-threads or the take-up of the web, or both. For instance, I am able to secure the desired effect by raising the driving-pawl of the take-up motion. This stops the take-up motion and causes the weft-threads to be laid closer together in both plies or cloths just before the joint or uniting-band is woven. The result of this last is to render the cloths or plies heavier, as at 5 5, so as to prevent the weft-threads from separating where the plies or cloths come together when the sides of the bag are subjected to a heavy strain tending to tear them apart at the joint or uniting-band. I now cause the two plies or cloths to pass backwardly in the loom sufficiently to enable the last wefts of both to bring up against the reed. This is effected most readily in practice by pressing the whip-roll backwardly. The cloth or ply that is the longer will bring up against the reed the earlier of the two, but the warps pertaining thereto will give or yield enough so as to permit the other to bring up fairly also. The last wefts of both plies or cloths will be even at

the starting of the joint and ready to be interwoven and will produce a good joint. Then I weave the joint or uniting-band. No such opening as has been mentioned earlier herein will be found in either ply or cloth when the foregoing procedure is followed. After completing the joint or uniting-band, I preferably cause also the first few wefts of the two plies or cloths of the next bag to be taken up more closely than those across the width of the bag.

It has been found in practice by me that in the process of weaving seamless bags, except perhaps those of exceedingly thin goods, it is practically impossible to produce a uniting-band of sufficient width in plain weave. In the production of the two separate plies or cloths which constitute the opposite sides of the bag the use of so many warp-threads is necessitated that when these latter are to be interwoven to form the uniting-band the crowding and massing together of the same becomes too great to permit of the use of a plain weave for any length of time—that is to say, when it is attempted to produce a plain weave, with the warp threads equally divided between the two planes of each shed, the crowding together of the warp-threads is so great as to resist materially the beating up of the weft, and, through the resistance offered to the working of the lay, obstructs the operation of the loom. It is possible to drive home properly a few picks of weft, but proves inadvisable to attempt to make the uniting-band of customary width in plain weave. Sometimes the friction produced in the beating up of the weft operates to draw the warp-threads forward in the loom at too great rate of speed.

On account of the foregoing difficulties and disadvantages a twill-weave sometimes is adopted in practice, and sometimes the warp-threads are unequally divided in shedding for the band. Thus in some cases three of the harness-frames are grouped together and move as one, while the fourth operates alone, three-fourths of the warp-threads lying in one plane of each shed and one-fourth in the other plane. When these plans are adopted, however, the two plies of the bag are not sufficiently secure and they are more or less liable to pull apart and withdraw the ends of the warp from the uniting-band. In accordance with one part of the invention I form the uniting-band or seam plain or of other close and firm weave in the first and last portions thereof, and with a weave of a different texture in the intermediate or middle portion thereof. Preferably I form the said band partly solid and partly tubular—that is to say, I form the middle portion thereof tubular, as at 6, while the portions thereof in which the two plies of the next adjacent bags are united are solid, as at 7 7. These solid portions may be of any suitable close weave other than plain. Their width is not very great. In separating the bags I cut or tear along the middle line of the intermediate portion of each uniting-band. When the said portion is tubular, two projecting flanges 8 8 are left along each side edge of the bag. It is preferred that the said intermediate portion of the band should be tubular, inasmuch as in consequence of having the projecting ends of the warp-threads interwoven to form the two separate plies which constitute the two flanges, as aforesaid, the individual warp-threads are more securely interwoven with the weft-threads and the weft-threads produce a more effectual frictional hold upon the said ends of the warp-threads, the result being that when strain is exerted by a force tending to spread the sides of the bag apart from each other the withdrawal of the ends of the warp-threads from the uniting-band or seam is resisted effectually, and therefore the side edges of the bags are made secure and strong.

While I have illustrated a bag-web in which the bags are formed with their openings at one edge of the web—that is to say, a web in which the bags extend transversely of the web, and in which the uniting-bands or seams also extend transversely—I wish it to be understood that I do not limit myself entirely to the production of bags by weaving them transversely in the web. Certain features of the invention obviously are applicable whether the bags are formed transversely or longitudinally of the web.

I claim as my invention—

1. The improved woven seamless bag having bands of weft reinforcement at and adjacent to the union of the sides thereof, substantially as described.

2. The improved woven seamless bag having the sides thereof interwoven to form uniting-bands or joints at the edges, as at 7, 7, and having the pair of wings or flanges 8, 8, along the outer edge of each uniting-band or joint, to secure against withdrawal the ends of the threads which extend transversely across the bag, substantially as described.

3. The improved continuous bag-web consisting of two plies or cloths which are interwoven at intervals to give shape to the respective bags, and having the intermediate tubular portions 6, 6, at the places where the bags are separated from one another, substantially as described.

4. The improved continuous bag-web consisting of two plies or cloths which are interwoven at intervals to give shape to the respective bags, and having the bands in which the said plies or cloths are interwoven composed of portions of plain or other firm weave with an intermediate portion of a weave of a different texture to relieve the crowding of the threads, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JESSE A. KNIGHT.

Witnesses:
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