

March 3, 1942.

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2,275,159

METHOD OF MAKING SAILS, AWNINGS, OR TENTS

Filed Feb. 19, 1940

2 Sheets-Sheet 1

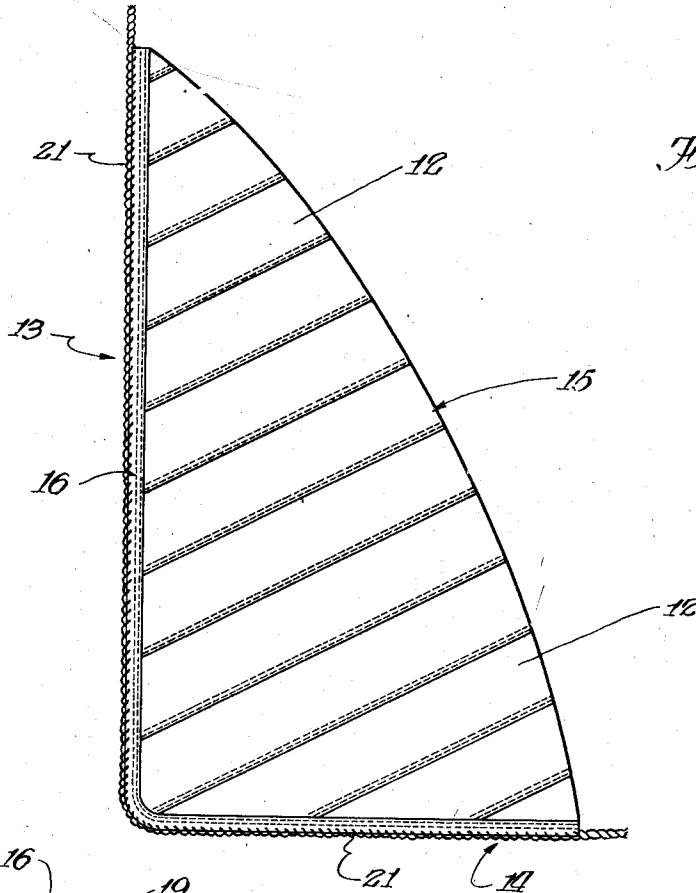


Fig. 1

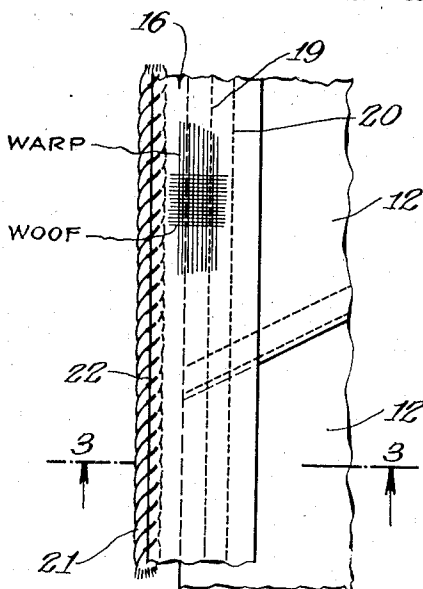


Fig. 2

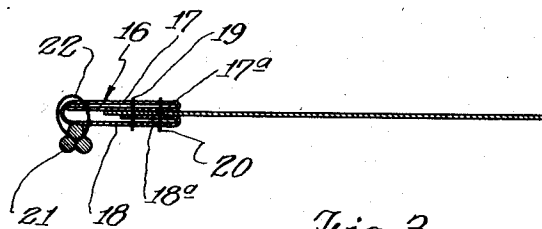


Fig. 3

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2 Sheets-Sheet 2

Fig. 4

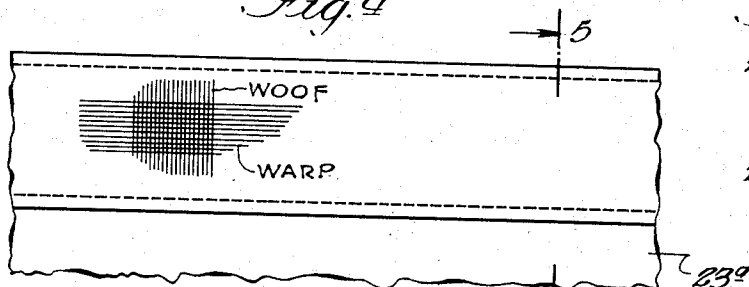


Fig. 5

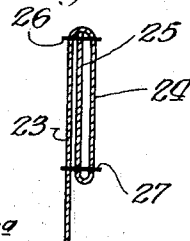


Fig. 6

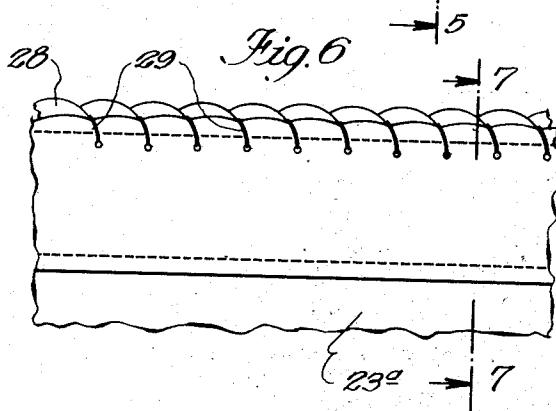


Fig. 7

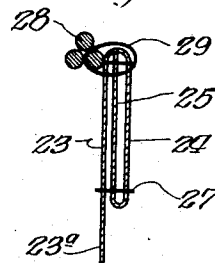


Fig. 8

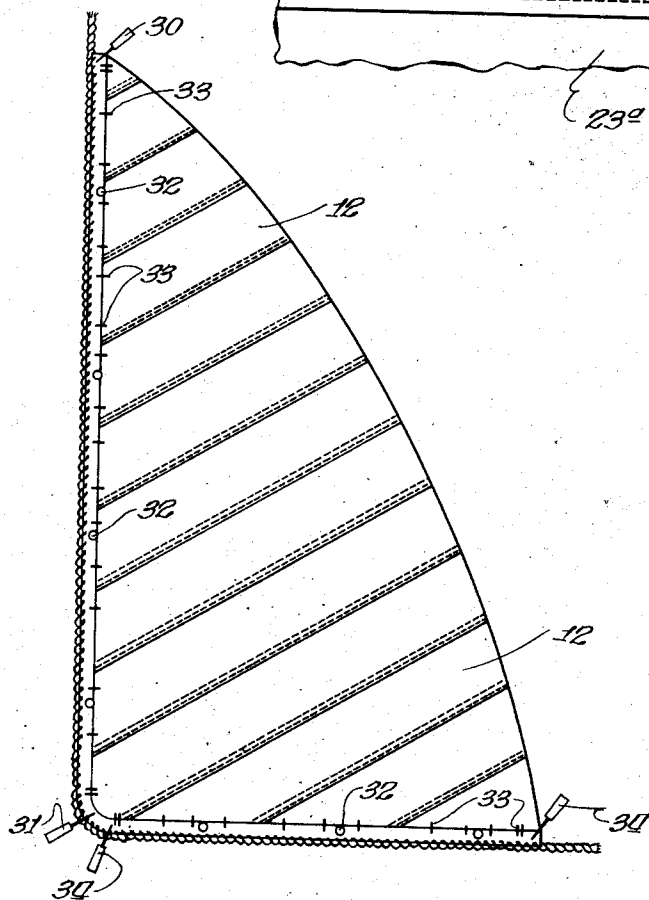
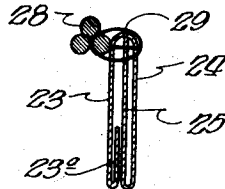


Fig. 9

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UNITED STATES PATENT OFFICE

2,275,159

METHOD OF MAKING SAILS, AWNINGS,
OR TENTS

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Application February 19, 1940, Serial No. 319,605

7 Claims. (Cl. 112—262)

My invention relates to certain improvements in reinforced sails, awnings or tents and to certain improved methods of making such products.

Fabric products of the type mentioned comprise suitable lengths of fabric strips placed side by side with the edges of adjacent strips overlapped and sewed together. Certain edges at least of such products almost always require additional reinforcing which is ordinarily accomplished by attaching to such edges suitable reinforcing means such as rope, wire, tape, or webbing. A method commonly used is to fold the fabric over upon itself along the edge to be reinforced to provide a hem and then to sew rope, usually by hand but sometimes by machine, along the outer edge of the hem. Rope is usually employed to reinforce the edges because it is more durable, possesses greater flexibility in stretching than most of the other forms of reinforcement and it is otherwise more satisfactory.

The strains throughout an area of fabric cloth such as those developed in a sail in use are not even and it becomes necessary in making the sail to "rope in," "rope tight," or "rope even." "Roping in" means to sew the rope to the hem of the sail in such a way that more cloth is used than rope, for example 13 inches of a cloth hem carried by the fabric may be distributed along a 12" stretch of rope. "Roping tight" means to attach the rope to the cloth hem in such a manner that less cloth is used with respect to a given stretch of rope which makes the cloth tight and the rope slack. "Roping even" means that the rope attached to the cloth hem is substantially equal in length to the length of the hem. It is quite common to use the three different types of roping at different places in a continuous length of rope on one hem of a sail. The roping to some extent at least controls the shape or set of a sail and to a much greater extent is the cause of wrinkles in the sail which are detrimental. According to this method, therefore, the final results depend largely upon the manner in which the sailmaker attaches the rope or other reinforcing means to the edge of the sail.

While a sailmaker may be highly skilled in sewing a reinforcing rope to the edge of a sail he is not as a rule skilled in the design of sails and he does not know the final results of his work unless the job has been done so poorly that the sail is returned for reroping. Among the many disadvantages inherent in the method heretofore practiced the following may be mentioned: No two sailmakers rope exactly the same, which means that there will be a difference in the fin-

ished sail if one, having started a job, must for any reason leave it so that another must finish it, thus causing a loss of flexibility in the factory. The sailmaker attaches the rope at one end to his bench and works along the rope to the fastened point, changing his position many times with respect to the material, and that affects the quality of the work whether the sailmaker is conscious of the fact or not. A sail maker's roping may vary from hour to hour while working on the same sail due to fatigue or other variations in his physical condition. A given length of rope will not stretch equally throughout its length and even if the roping be done properly to accommodate the stretch of the rope the variations in the stretch may result in an unsatisfactory finished product. Moreover, the roper cannot start his work until most of the other work is finished. As most sails, tents, and similar products are custom-built and a stock may not be built up during a dull season, the number of finished products produced is dependent upon the number and efficiency of the ropers available in the active season. It is apparent, therefore, that even though the most highly skilled workers be employed the factory owner cannot be sure of his finished products.

One of the objects of my invention is to provide an improved sail, awning or tent reinforced along one or more of its edges, wherein the fabric will be so arranged and distributed along such edges with respect to the reinforcement that when the finished product is secured in place in tensioned or stretched condition for use the fabric adjacent such reinforced edges will be substantially smooth, free of wrinkles and under substantially uniform strain throughout the length of the respective edges.

In certain forms of my invention the fabric making up the sail or other product will comprise a plurality of strips having adjacent edges overlapped and secured together, the strips extending on a bias with respect to one edge at least of the area of fabric thus produced. It is a further object of my invention to provide a reinforced hem for one or more edges of the area of fabric wherein the warp and woof threads of the cloth used in making the hem will extend substantially parallel and at right angles respectively to the hem whereby the full strength of the warp threads of the hem will be made use of in reinforcing the fabric comprising the biased strips to which the hem is secured.

It is another object of my invention to provide an improved method of making products of the

type mentioned according to which reinforced hems of suitable lengths may be made in advance, kept in stock and then secured when desired to the edges of the respective areas of fabric making up the finished products, usually custom-built, whereby the important step of arranging or distributing the fabric with respect to the previously formed and tensioned or stretched reinforced hem to produce the finished product may be carried out by individuals specially selected and trained for that particular work, and the reinforced hem and the fabric then match-marked so that when the parts are sewed together the marks on one part will register with those on the other part. By my improved method the arrangement or distribution of the fabric with respect to a tensioned reinforced hem may be measured manually and gauged visually by a person best qualified for doing that work, and the work may be done from the standpoint of the entire finished product rather than just a short length of the edge of the fabric which is the case when the reinforcing means is attached according to the prior practice; and it becomes practical, therefore, to give proper consideration to the various factors affecting the stretch of the reinforced hem and to average out over the entire length of the reinforced edge of the fabric the various inequalities which are bound to develop in the attachment of the rope or other reinforcing means to a hem of cloth, all to the end that a high grade, satisfactory finished product is insured.

The invention consists in the novel constructions and arrangements to be hereinafter described and claimed for carrying out the above stated objects and such other objects as will appear from the following specification, and it consists further in the improved method of making sails, awnings or tents to be hereinafter described and claimed.

The invention is illustrated in certain preferred embodiments in the accompanying drawings, wherein—

Fig. 1 is an elevational view of a sail embodying the principles of my invention;

Fig. 2 is a view on an enlarged scale of a fragmentary portion of the mast edge of the sail showing more clearly how that edge of the sail is reinforced;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a plan view of a fragmentary portion of canvas or sailcloth folded and creased to make a hem for a sail or the like;

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4;

Fig. 6 is a view similar to Fig. 4 showing a length of rope attached to the outer edge of the hem;

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6;

Fig. 8 is a view similar to Fig. 7, the stitching at the lower or inner edge of the hem having been removed for the insertion of the edge of the fabric making up the sail or other product; and

Fig. 9 is a plan view of a reinforced hem placed along the mast and foot edges of a sailblank in proper relation and match-marked ready for the parts to be sewed or otherwise secured together.

Like characters of reference designate like parts in the several views.

Referring first to Figs. 1 to 3, it will be seen that the sailblank comprises a plurality of strips

12 of sailcloth or other suitable fabric arranged with their adjacent edges overlapped and sewed together. The strips extend on a bias with respect to the mast edge 13, the foot edge 14, as well as the leech edge 15. The sail may be provided with a hem 16 which may be constructed as shown in Fig. 3 and comprises main folds 17 and 18, and flap portions 17a and 18a carried by and folded back against the inner sides of the respective main folds 17 and 18. The mast and foot edges of the sailblank may be inserted between the flaps 17a and 18a as shown in Fig. 3 and the parts secured together by lines of stitching at 19 and 20.

The cloth forming the hem 16 is preferably folded so that the warp threads thereof will extend parallel and the woof threads thereof will extend at right angles substantially to the finished hem, as shown in Fig. 2. In the embodiment shown, a reinforcing member in the form of a three-strand hemp rope 21 is secured by stitching 22 to the outer edge of the hem. Any suitable form of anchoring means (not shown) such as grommets, fittings, or the like may be secured in any desired manner to the corners of the sail.

The various steps of constructing a sail or other similar product according to my novel method are illustrated in Figs. 4 to 9. In making my improved reinforced hems I preferably take a strip of sailcloth, canvas, or other suitable material of the desired length and fold and crease it at one side to provide main folds 23 and 24 of the desired width, say 1" to 2", the flap portion 25 of the main fold 24 preferably being folded inwardly against the inner side thereof, as shown in Fig. 5. Basting threads 26 and 27 may be employed temporarily to hold the parts in the aforesaid relation. The parts forming the hem are arranged so that the warp threads extend parallel and the woof threads extend at right angles substantially to the hem as shown on Fig. 4. In the embodiment shown, a reinforcing member in the form of a three-strand hemp rope 28 is next secured to the outer edge of the hem by stitching 29 which may be done either by hand or machine. The excess cloth is then cut away adjacent the inner edge of the hem so as to leave a narrow marginal or flap portion 23a, say about one-half inch in width. The basting threads 27 are next removed so that the hem may be opened and the marginal portion 23a turned inwardly against the inner side of the main fold 23, the parts of the hem then being in the relation shown in Fig. 8. The excess cloth cut away may be used, of course, for making other hems.

The reinforced hem thus constructed is now ready for positioning alongside of and attachment to the sailblank. The latter may be made as heretofore described and either before or after the reinforced hem. Usually the reinforced hem is attached first to the mast edge of the sailblank. In doing so, the roped hem may be secured at one end to the floor by any suitable device, such as an awl 30. The roped hem is then stretched or tensioned by the sail designer to the extent he deems advisable, considering such factors as the length of hem being used, the size, condition and quality of the rope sewed to the hem and the service expected of the finished product, after which the roped hem is secured to the floor at its opposite end, as by an awl 31. The mast edge of the sailblank is then placed between the awls 30 and 31 and inserted

into the opened edge of the hem between the hem portions 23a and 25, care being taken by the sail designer to arrange the edge of the sailblank, with respect to the tensioned roped hem, so that when the hem and the blank are secured together and the sail is placed in use all portions of the sail adjacent the mast will be smooth, free of wrinkles and under substantially uniform strain. With that objective in view, the sail designer carefully arranges and distributes the edge of the sailblank with respect to the roped hem, providing fullness in the blank at the places where desired and providing little or no fullness at those points where not desired. The sail designer may use thumb tacks 32 or the like to hold temporarily the edge of the sailblank in the desired relation to the hem. The sail designer then match-marks the hem and the sailblank at points 33 from one end of the hem to the other. The awls and the thumb tacks may then be removed, and the roped hem and the sailblank, by means of a sewing machine, may then be secured together by one or more rows of stitching, care being taken to have the respective marks on the roped hem match those on the sailblank.

In like manner, that portion of the roped hem for reinforcing the foot edge of the sail may be tensioned as desired and secured by awls 34; and the foot edge of the sailblank may be arranged as desired with respect to such portion of the roped hem, the parts temporarily held by thumb tacks and then match-marked between the awls 34, as indicated. The awls 34 and thumb tacks are now removed and the hem is then sewed to the sailblank with the respective marks on the hem in register with those on the sailblank.

The advantages of my new construction and method may be summarized as follows:

(a) The extent to which the roped hem is stretched, considering all the factors that should be taken into account, and the arrangement or distribution of the fabric making up the sail or other product along the roped hem can be carried out by one or more individuals specially selected and trained for that important work, thereby obtaining uniform and satisfactory finished products.

(b) In the practice of my improved method, imperfections in the sewing of the rope to the hem, and variations in the stitching employed by different sailmakers to secure the rope to the hem are not transmitted to the finished product. The various inequalities of securing the rope or other reinforcing means to the hem are averaged out in such a way that they do not adversely affect the finished product. The arrangement or distribution of the fabric with respect to the tensioned reinforced hem may be measured manually and gauged visually by the individual carrying out those operations from the standpoint of the entire sail, rather than just a short length of the edge of a sailblank to which the rope has heretofore been attached with the result that a higher percentage of top grade finished product is readily obtained.

(c) Inasmuch as products of the type mentioned are usually custom-made, it is possible by my improved method to make up during slow seasons of the year an inventory of the roped hems for use during rush periods. The men who sew the rope to the hem are thus free during rush periods to do other work and it is possible, therefore, to spread the employment of the working force more uniformly over a larger portion of the

year, as contrasted with having a large force during the busy period and practically closing the factory during dull periods.

(d) The factory is not dependent upon individual sailmakers for a continued uniform output of finished product.

(e) Sailmakers of less skill may be employed for stitching the ropes to the preformed hems, which is an advantage, because such men are employed in a trade that is highly seasonal, the demand for their services is very seasonal and highly skilled workers are not always available when needed.

(f) A hem or tabling, as it is sometimes termed, of a strength, construction and material best suited for the service it is to perform may be used and thus the requirements of a particular product for a particular service may be given full consideration.

While I have illustrated in detail and have specifically described a certain preferred construction and a certain preferred method for making such construction it is to be understood that such has been done merely for the purpose of illustrating the principles of my invention. I do not intend therefore to limit my invention to the details of construction shown and described except only insofar as certain of the appended claims are specifically so limited as it will be obvious that modifications may be made both in the construction and in the method without departing from the principles of the invention.

I claim:

1. In the herein described method of making a sail, awning or tent reinforced along one edge, the steps of making an area of fabric, making separately from the fabric a reinforced hem, placing the hem along one edge of the fabric, tensioning the hem as desired and temporarily securing it at spaced points, positioning the fabric at its said edge as desired with respect to the hem and temporarily holding the fabric in such relation, match-marking the hem and the fabric adjacent its said edge, and then securing the hem to the fabric with the marks on the hem substantially matching those on the fabric.

2. In the herein described method of making a sail, awning or tent reinforced along one edge, the steps of making an area of fabric, making separately from the fabric a hem and securing to it a reinforcing member, placing the reinforced hem along one edge of the fabric, tensioning the reinforced hem as desired and temporarily securing it at spaced points, positioning the fabric at its said edge as desired with respect to the reinforced hem and temporarily holding the fabric in such relation, match-marking the reinforced hem and the fabric adjacent its said edge, and then securing the reinforced hem to the fabric with the marks on the reinforced hem substantially matching those on the fabric.

3. In the herein described method of making a sail, awning or tent reinforced along one edge, the steps of making an area of fabric, making separately from the fabric a hem and securing a reinforcing member to the outer edge of the hem, placing the reinforced hem with its inner edge along one edge of the fabric, tensioning the reinforced hem as desired and temporarily securing it at spaced points, positioning the fabric at its said edge as desired with respect to the reinforced hem and temporarily holding the fabric in such relation, match-marking the reinforced hem and the fabric adjacent its said

edge, and then securing the reinforced hem to the fabric with the marks on the reinforced hem substantially matching those on the fabric.

4. In the herein described method of making a sail, awning or tent reinforced along one edge, the steps of making an area of fabric, making separately from the fabric a hem and securing by stitches a rope to the outer edge of the hem, placing the roped hem with its inner edge along one edge of the fabric, tensioning the roped hem as desired and temporarily securing it at spaced points, positioning the fabric at its said edge as desired with respect to the roped hem and temporarily holding the fabric in such relation, match-marking the roped hem and the fabric adjacent its said edge, and then securing the roped hem to the fabric with the marks on the roped hem substantially matching those on the fabric.

5. In the herein described method of making a sail, awning or tent reinforced along one edge, the steps of making an area of fabric, folding cloth upon itself so as to make separately from the fabric a hem with the warp threads thereof extending parallel to the hem, securing a reinforcing member to the outer edge of the hem, placing the reinforced hem with its inner edge along one edge of the fabric, tensioning the reinforced hem as desired and temporarily securing it at spaced points, positioning the fabric at its said edge as desired with respect to the reinforced hem and temporarily holding the fabric in such relation, match-marking the reinforced hem and the fabric adjacent its said edge, and then securing the reinforced hem to the fabric with the marks on the reinforced hem substantially matching those on the fabric.

6. In the herein described method of making a sail, awning or tent reinforced along one edge,

the steps of securing together at their adjacent edges fabric strips to make an area of fabric with the strips extending on a bias with respect to one edge at least of the fabric, folding cloth upon itself so as to make separately from the fabric a hem with the warp threads thereof extending parallel to the hem, securing a reinforcing member to the hem, placing the reinforced hem along one edge of the fabric, tensioning the reinforced hem as desired and temporarily securing it at spaced points, positioning the fabric at its said edge as desired with respect to the reinforced hem and temporarily holding the fabric in such relation, match-marking the reinforced hem and the fabric adjacent its said edge, and then securing the reinforced hem to the fabric with the marks on the reinforced hem substantially matching those on the fabric.

7. In the herein described method of making a sail, awning or tent reinforced along one edge, the steps of securing together at their adjacent edges fabric strips to make an area of fabric with the strips extending on a bias with respect to one edge at least of the fabric, folding cloth upon itself so as to make separately from the fabric a hem with the warp threads thereof extending parallel to the hem, securing by stitches a rope to the outer edge of the hem, placing the roped hem with its inner edge along one edge of the fabric, tensioning the roped hem as desired and temporarily securing it at spaced points, positioning the fabric at its said edge as desired with respect to the roped hem and temporarily holding the fabric in such relation, match-marking the roped hem and the fabric adjacent its said edge, and then securing the roped hem to the fabric with the marks on the roped hem substantially matching those on the fabric.

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