

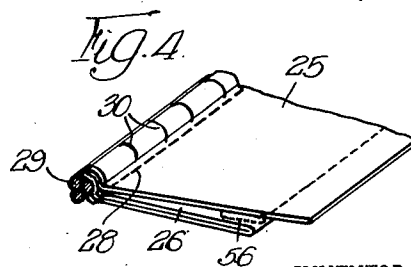
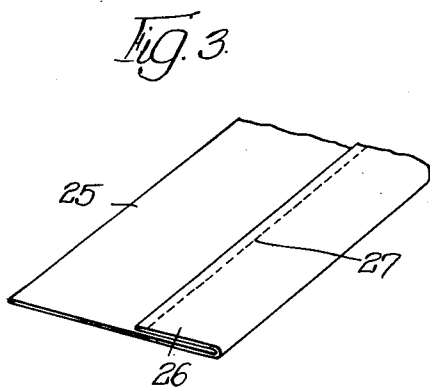
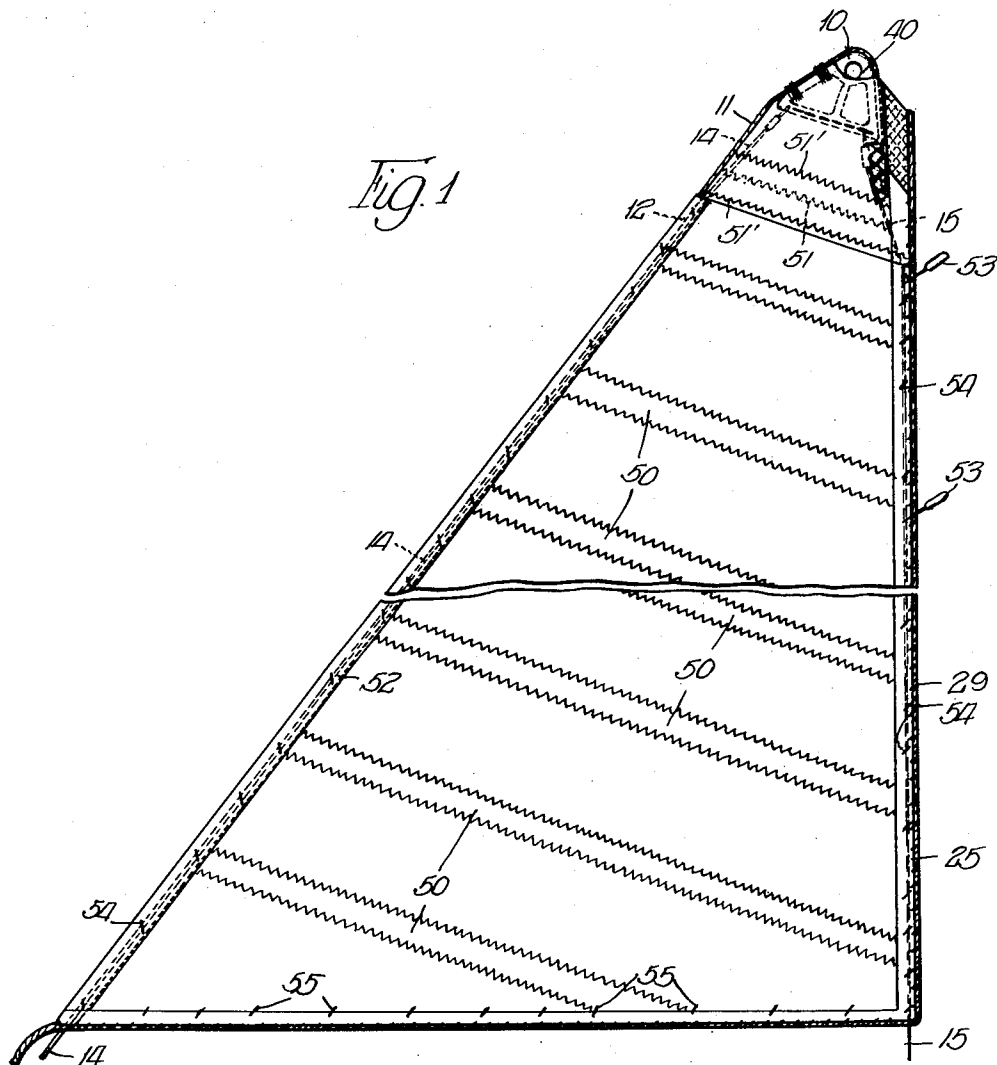
June 18, 1957

R. E. PEGEL ET AL
METHOD OF MAKING SAILS

2,796,038

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2 Sheets-Sheet 1



INVENTORS
Robert E. Pegel
BY Kenneth A. Nelson,
George J. Haight &
George W. Simmons

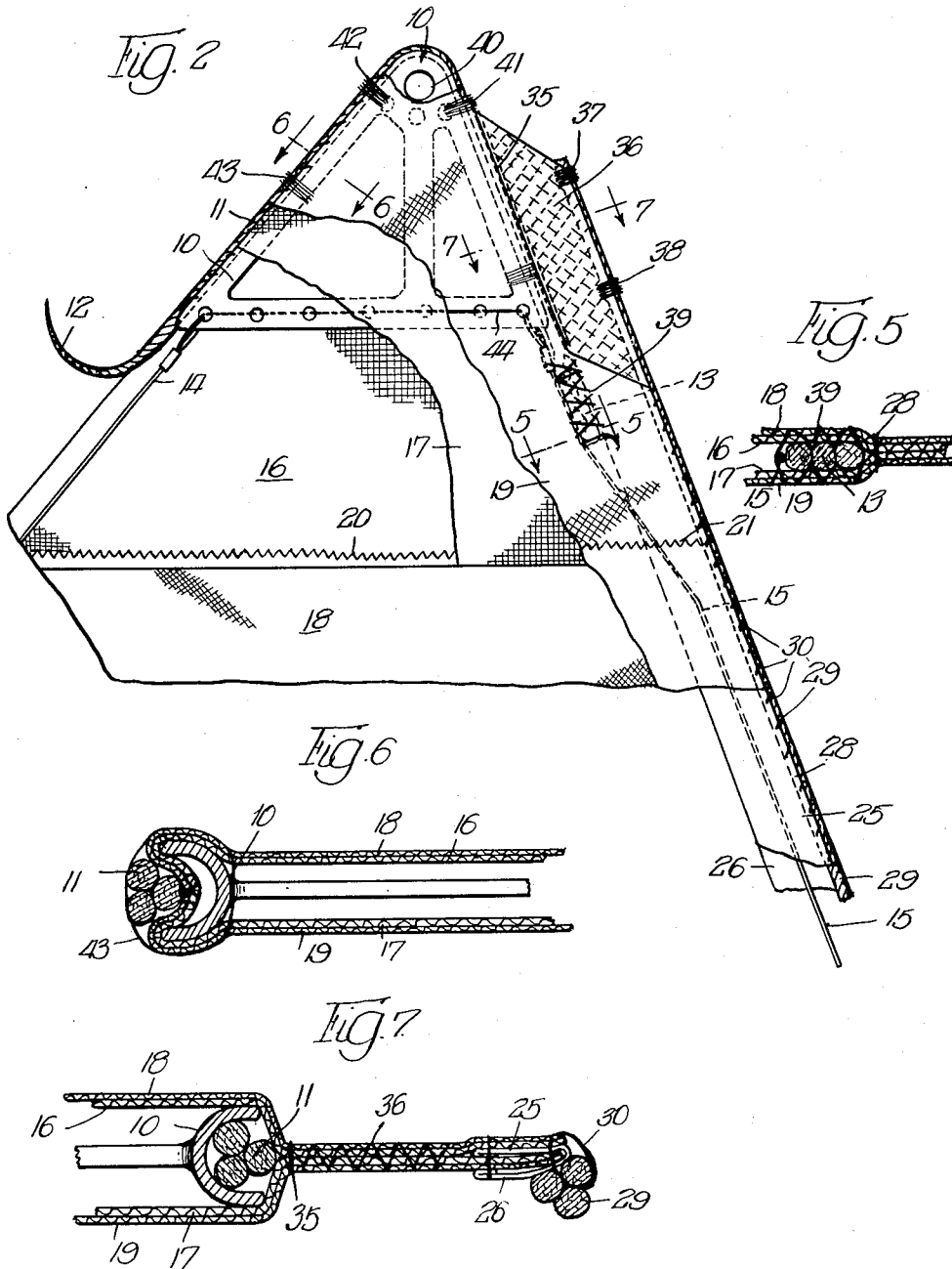
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INVENTORS.
Robert E. Pegel,
BY Kenneth A. Nelson,
George F. Hargis &
George F. Simmons

1

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METHOD OF MAKING SAILS

Robert E. Pegel and Kenneth A. Nelson, Chicago, Ill.

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4 Claims. (Cl. 114—103)

This invention relates to sail-making and has for its principal object the provision of a new and improved method of making sails.

It is a main object of the invention to provide a method of making sails, which insures maximum uniformity of quality of the product.

Another object of the invention is to provide a method of making sails, wherein a substantial portion of the work can be done prior to the actual fabrication of the sail, this work being done by relatively inexperienced workers thereby reducing to a minimum the work of the expert sail maker.

Another object of the invention is to provide a method of making sails, wherein the framework of the sail can be made up during the slack season and placed in stock for future use thereby to reduce the amount of work to be done in the fabrication of sails during the busy season of the industry.

Further objects of the invention not specifically mentioned here will be apparent from the detailed description and claims which follow, reference being had to the accompanying drawings in which:

Fig. 1 is a plan view of the sail illustrating the invention;

Fig. 2 is a fragmentary plan view of the framework of a sail with parts broken away the better to show the construction;

Fig. 3 illustrates a step in the process of forming the reinforcement portion of the framework;

Fig. 4 is a view illustrating the completed reinforcement of the framework;

Fig. 5 is a cross sectional view taken along the line 5—5 of Fig. 2, looking in the direction of the arrows;

Fig. 6 is a cross sectional view along the line 6—6 of Fig. 2, looking in the direction of the arrows; and

Fig. 7 is a cross sectional view along the line 7—7 of Fig. 2.

Sail making is a highly seasonable business and during portions of the year sail factories are exceedingly busy, while during other portions of the year there is little or no work to be done. In order to keep a sail making factory staffed with competent help, arrangements must be made to provide work that can be done during the slack season thereby to relieve the load during the rush periods. This is particularly true in the manufacture of sails for racing craft.

In the manufacture of sails, much of the work can be done satisfactorily by relatively inexperienced workers, although certain portions of the sail making requires the highly skilled efforts of an experienced sail maker.

Heretofore in the industry it has been the practice to fabricate the sail in its entirety and then to "rope in" the sail by attaching a strain rope to a reinforcing member on the luff and foot edges of the sail. The skill of the sail maker in roping in the sail reflects in its performance in the surf.

In certain instances in the prior art of which we are

2

aware, efforts to speed up the work of the sail maker in roping in a sail have resulted in the formation of a reinforcing member for the luff edge of the sail, to which member the strain rope is attached by relatively unskilled help and the sail maker ropes in the sail by registering the main area with the reinforcement, and after applying the desired tension to the sail area match-marks it and the reinforcement so that subsequent sewing together of the members with the match-marks in register results in roping in of the sail in the manner intended by the sail maker.

The present invention improves upon the prior practices employed in sail making by fabricating and stocking frameworks for sails, which frameworks consist of a headboard sub-assembly with reinforcement patches, ropes and strain wires or cables attached thereto, and a reinforcement sub-assembly for the luff and foot edges of the sail, these two sub-assemblies being permanently and finally joined together to form the framework of the sail. Frameworks so made are relatively inexpensive and can be stocked in standard sizes during the slack season of the year to be withdrawn from stock and employed in the final fabrication of the sail as required to fill orders at hand. In this manner the work of the factory can be spread more uniformly over the entire year and skilled employees required during the busy season may thus be retained during slack season and kept busy at productive work without tying up an excessive amount of working capital in stocked parts.

In carrying out the teachings of the present invention, the headboard sub-assembly consists of the headboard unit, usually metallic, to which a reinforcing rope and reinforcing wires or cables are attached. Headboard patches, each consisting of a piece of heavy canvas overlaid with a somewhat larger patch of sailcloth, are attached to the headboard member. The reinforcement for the luff and foot edges of the sail is made by folding over a strip of material to which the strain rope is sewed and the reinforcement so made attached to the headboard sub-assembly with one of the reinforcing patch members extended between the folds of the reinforcement and the other reinforcing patch member overlying the reinforcement. The framework thus formed is placed in stock for future use.

When the sail is to be fabricated, the area of sailcloth is prepared to substantially the plan of the sail and registered with the framework by inserting the upper edge of the area between the patches of the headboard where it is secured by sewing. The leech edge of the sail area is then hemmed with the leech reinforcing or strain wire enclosed in the hem. The assembly so formed is then ready for roping in and the luff edge reinforcement is tensioned to a desired degree, the sail area registered therewith, and after desired tension has been applied to the various portions of the edge of the sail area, match-marks are made. In a similar manner the foot of the sail is registered with the foot portion of the reinforcement and the sail is then ready to be sewed with the match-marks in register thereby to insure that the sail will be roped in in the manner desired by the sail maker.

During the formation of the seam along the luff edge of the sail, the other reinforcing or strain wire that has previously been attached to the headboard is incorporated in the seam projecting therefrom at the bottom of the sail. After the stitching of the seams has been finished, the sail is completed by the insertion of grommets and the like, and by tensioning the luff edge of the sail and reinforcing wire and securing that wire thereby to insure that the maximum length to which the luff edge can be stretched is as desired.

From the drawings it will be seen that the headboard assembly, consisting of the generally triangular metallic member 10, is formed by attaching thereto a short piece

of rope 11, one end of which is formed in a rat tail 12. The opposite end of this rope is braided into a short length 13 and reinforcing wires 14 and 15 are attached and secured in any preferred manner.

A pair of reinforcing patches are formed from two generally triangular pieces of heavy canvas 16 and 17 and sailcloth members 18 and 19, by sewing a canvas 16 to the member 18 along the bottom edge of the canvas, as shown at 20. Members 17 and 19 are similarly secured together by stitches 21.

The reinforcement for the luff and foot edges of the sail is made in the manner illustrated in Figs. 3 and 4 and consists of a ribbonlike band of fabric 25 folded over upon itself, as indicated at 26, and sewed along line 27. The remaining portion of the band is then folded over along this stitch line 27 and again sewed, as indicated at 28 in Fig. 4. A strain rope 29 is hand-sewed to the last formed folded edge, as indicated at 30 in Fig. 4. The reinforcement thus formed is of sufficient length to extend along the luff and foot edges of the sail.

The reinforcement thus formed is registered with the headboard sub-assembly, with the reinforcing patch comprising members 16 and 18 inserted between the folded over portions 25 and 26 of the reinforcement. The headboard patches, consisting of members 17 and 19, are overlaid on the portion 25 of the reinforcement and sewed in place by a row of stitches 35, Fig. 2, and by quilting stitches 36 at the uppermost end of the reinforcement. The strain rope 29 is secured to the assembly by stitches 37 and 38 and the braided end of the reinforcing rope 11 secured by cross stitches 39 as shown.

The framework thus formed is completed by finishing off the top edge of the reinforcing patches to leave the eyelet of the framework exposed, as indicated at 40. The headboard patches 16, 18, and 17, 19, are folded over the channel in the headboard in the manner shown in Fig. 6 and sewed together, and the reinforcing rope 11 secured to the headboard and over the fold thus formed by stitches 41, 42, and 43, which are hand made.

The framework so formed is placed in stock and when it is desired to form the completed sail the main area of the sail is formed usually with the fabric cut on a bias with respect to the lug and foot edges. Suitable pleats or seams 50 are formed in the main area to reinforce it. The top portion of the main area of the sail is overlaid on the bottom headboard patch comprising members 16 and 18, and sewed thereto by a row of stitches 51, shown in dotted lines in Fig. 1.

The leech edge in the main sail area is then hemmed, as indicated at 52, with the reinforcing wire 14 incorporated in the hem. The lower portion of the top headboard reinforcing patch, consisting of members 17 and 19, is then laid over the lower headboard patch and upper portion of the sail area and secured by additional rows of stitches 51', shown in full lines in Fig. 1. The rat tail portion 12 of the headboard reinforcing rope is hand-sewed to the leech edge of the assembly to reinforce the junction of the main sail area with the headboard assembly.

These operations having been completed, the sail is ready for "roping in," and to accomplish this the headboard is secured to a work surface and tension applied to the reinforcement sufficient to insure that it will lie in a straight line. The luff edge of the main sail area is then inserted between the folded portions of the reinforcement and tension is applied to the sail area as desired and secured by suitable means such as awls 53. In "roping in" the sail, certain portions of the sail area may be stretched so that eleven (11) inches of unstretched fabric are made to cover twelve (12) inches of the reinforcement; or it may be slacked so that thirteen (13) or fourteen (14) inches of unstretched sail area are crowded into twelve (12) inches of reinforcement length; or it may be "roped in even" with twelve (12) inches of sail area registered with twelve (12) inches of reinforcement.

As soon as the sail area and reinforcement have been

registered together, match-marks 54 are applied. In a similar manner, the foot portion of the reinforcement and the foot portion of the sail are registered together and match-marks 55 applied thereto.

The sail is then permanently sewed together with the match-marks in register, the projecting edge of the portion 25 of the reinforcement being folded over, as indicated at 56 in Fig. 4, so that no cut edges of material are visible. In the formation of this seam, reinforcing wire 15 is incorporated in the seam and projected from the sail so as to be available for tensioning and fastening as required, to limit the maximum length of the luff edge to a desired amount. The sail is then completed by the addition of grommets, eyelets, and the like, as required by the order under which it is being made.

Thus it will be seen that the process of the present invention enables the sail-making factory to fabricate a substantial portion of the sail during slack periods without tying up an excessive amount of capital, as would be required if the main area of the sail were then made up. When the sail is to be fabricated to complete an order, this main area is made up and immediately joined to the prefabricated framework facilitating speedy delivery of the sail.

Most of the work in the making of the sail can be performed by relatively inexperienced workers and expert craftsmanship is only required of the sail maker in roping in the sail and placing of the desired register marks thereon.

While we have chosen to show our invention by illustrating and describing a preferred embodiment of it, we have done so by way of example only, as there are many modifications and adaptations which can be made by one skilled in the art within the teachings of the invention.

Having thus complied with the statutes, and shown and described a preferred embodiment of our invention, what we consider new and desire to have protected by Letters Patent is pointed out in the appended claims.

What is claimed is:

1. The method of making sails which comprises: folding a ribbonlike band of fabric over on itself along a line approximately one-third in from one edge of the band; sewing the free edge of the folded over portion to the main body of the band; folding the remainder of the band over on the first folded portion along a line adjacent to the first seam; sewing a seam along the latter fold; sewing a rope to said latter fold; attaching a rope and a pair of reinforcing wires to a headboard; forming a pair of headboard patches each consisting of a generally triangular piece of canvas sewed along its base to a generally triangular larger piece of sail fabric; inserting one edge of one of the patches between the folds of the folded member to which the rope is sewed with the canvas piece up and and sewing said edge therein; laying the other patch over said folded member in registration with the first patch with the canvas piece down and sewing it thereagainst; and inserting the headboard between said patches and sewing it in place therein thereby to form a sail frame assembly.

2. The method of making a sail which comprises: forming an area of fabric to substantially the plan of the sail; forming a framework member by folding a fabric strip lengthwise and attaching a reinforcing rope thereto; attaching reinforcing wires to a headblock; securing to the headblock reinforcing facing members and a reinforcing rope; securing the reinforced framework to the headblock; securing the area of fabric to the headblock reinforcing facing members; hemming the leech edge of the area of fabric with one of said reinforcing wires encased in the hem; securing the headblock to a work surface; applying tension to the framework sufficient to insure that it lays straight; registering the luff edge of the area of fabric with the framework; tensioning said luff edge to a desired tension; match-marking the luff edge

5

and framework; tensioning the foot portion of the framework along a pattern defining the sail; registering the foot edge of the area of fabric with the foot portion of the framework; applying a desired tension to the foot portion of the fabric; match-marking the foot portion and framework; and sewing the area of fabric to the framework with the match-marks in register.

3. The method of making a sail which comprises making a headboard assembly consisting of a headboard with fabric facing members, a reinforcing rope and reinforcing wires attached thereto; making a reinforcement for the luff and foot of the sail, consisting of a ribbon of fabric folded upon itself lengthwise and a reinforcing rope sewed to the fabric along the folded edge thereof; securing together the headboard assembly and reinforcement to form the framework of the sail; shaping an area of fabric into a sail blank; registering the blank with the headboard assembly portion of the framework and securing it thereto; hemming the leech edge of the blank with one of the reinforcing wires encased in the hem; securing the headboard to a work surface; applying a desired tension to the reinforcement along the luff edge of the sail; registering the luff edge of the blank with the luff portion of the reinforcement; applying a desired tension to the luff edge of the blank and match-marking the blank and framework while maintaining that tension; applying a desired tension to the foot portion of the reinforcement; registering the foot portion of the blank to the foot portion of the framework; applying a desired tension to the foot portion of the blank; match-marking said foot portions while maintaining said tension; and sewing the blank to the framework with the match-marks in register.

4. The method of making a sail which comprises making a first sub-assembly consisting of a metallic headboard having fabric reinforcements fixed on the opposite

6

faces thereof, a rope reinforcement fixed to two of the edges thereof and a pair of reinforcement wires fixed to and extending from the third edge thereof; making a reinforcement sub-assembly for the luff edge and foot of the sail by folding a ribbon of fabric over one-third from one longitudinal edge thereof and sewing the folded over portion thereto, then folding the remainder of the ribbon on itself over said seam into position extending alongside of and beyond said first folded over portion and sewing a rope along the latter fold with stitches that extend through the three thicknesses of fabric so formed; securing together said sub-assemblies to form a framework for the sail; forming a sail blank from an area of fabric; securing the blank to the headboard sub-assembly; hemming the leech edge of the blank with one of said reinforcement wires encased in the hem; applying a desired amount of tension to the luff portion of the reinforcement sub-assembly; registering the luff edge of the blank to the tensioned portion of the reinforcement sub-assembly under a desired tension; match-marking said luff portions while maintaining said tensions; applying a desired amount of tension to the foot portion of the framework; registering the foot of the blank with said foot portion under a desired tension; match-marking said foot portions while maintaining said tensions; folding over the remaining portion of said ribbon on itself and the blank, and sewing the blank to the framework with the match-marks in register and with the second one of said pair of reinforcing wires encased within the framework.

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