Dec. 22, 1959 W. A. WESTON 2,918,276

DEVICE FOR FOLDING CHARTS AND THE LIKE

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FIG. 1

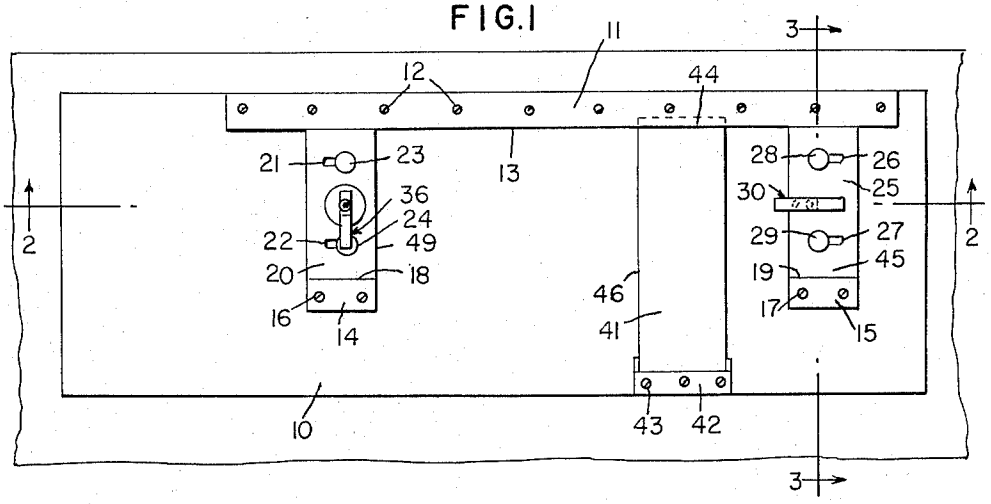


FIG. 2

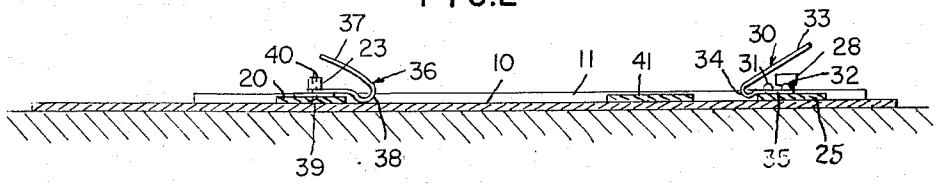


FIG. 3

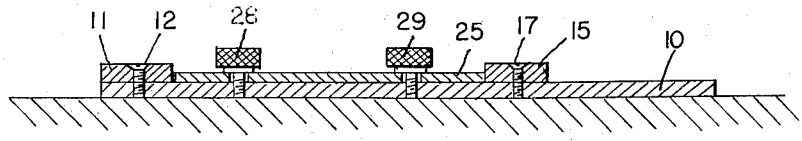
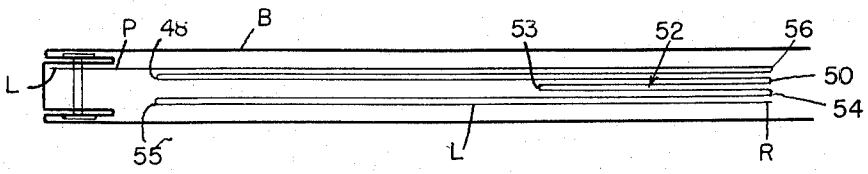


FIG. 4



INVENTOR

William Alexander Weston

BY Shoemaker & Mattare

ATTORNEYS

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FIG.5

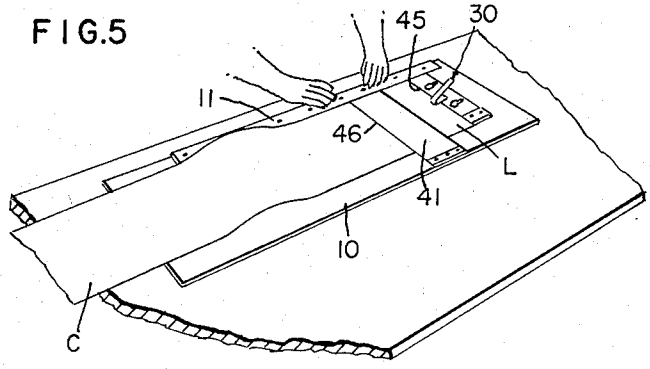


FIG.6

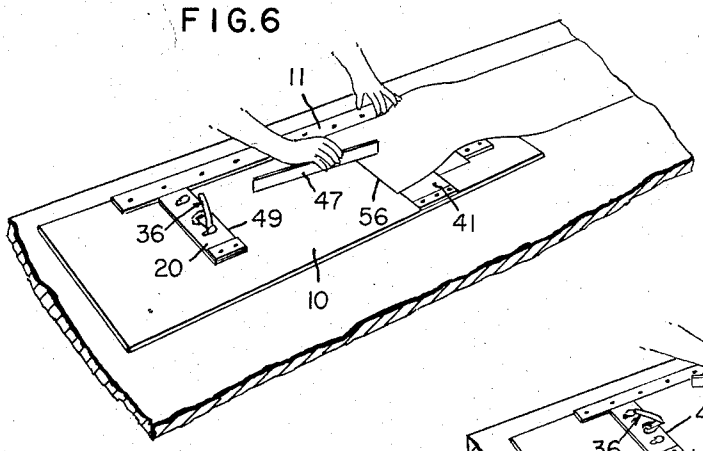


FIG.7

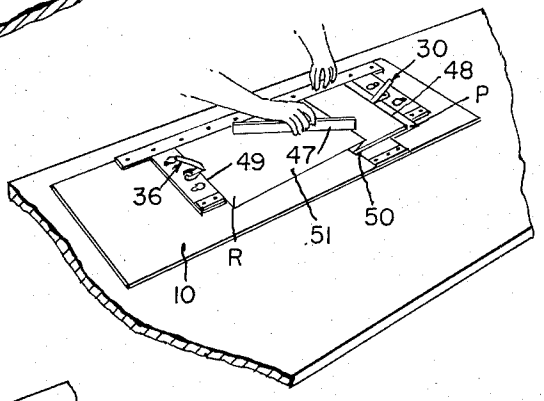
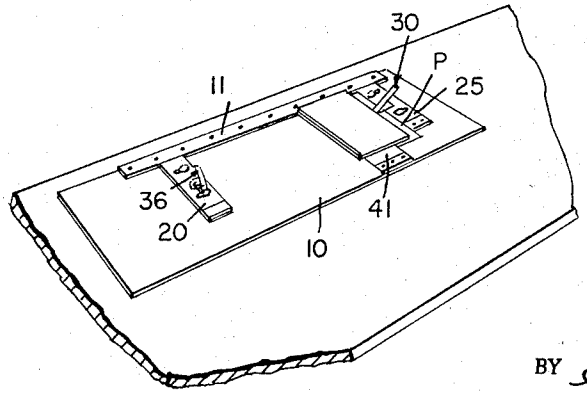


FIG.8



INVENTOR
William Alexander Weston

BY Shoemaker & Mattare

ATTORNEYS

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DEVICE FOR FOLDING CHARTS AND THE LIKE

William Alexander Weston, Hampton, Va., assignor to Newport News Shipbuilding and Dry Dock Company, Newport News, Va., a corporation of Virginia

Application November 20, 1957, Serial No. 697,561

2 Claims. (Cl. 270—61)

This invention relates to apparatus for and the method of folding charts and the like and pertains more particularly to a construction and method for folding charts of random length into even width folds so that the same may be incorporated in a bound volume.

One specific application of this invention is in preparing booklets for instruction purposes, particularly instruction books for ships wherein a great number of charts and the like must be incorporated, in folded form, in a booklet for instruction purposes. The charts and the like are of random lengths and it is desirable, of course, that the last fold in the chart be such that the right hand edge of the chart may be even with the free edges of the other sheets in the booklet. Since it is common practice to place the title or identification of the chart at the extreme right hand edge thereof, it is desirable to have the last fold such that the last sheet provided by the fold is a full width sheet, and this invention contemplates the provision of a random width fold at the next to the last fold.

It is, therefore, a primary object of this invention to provide a means and method of folding charts of random lengths wherein, in the folding process, there is made provision for a random width fold to compensate for the random lengths of the charts and so as to achieve a uniform and predetermined size or width of the sheets presented by the fold lines on the chart.

Still another object of this invention resides in the provision of an improved mechanism for folding the charts in which the fold lines are consistent and uniform so as to achieve a predetermined width of fold wherein provision is made for incorporating, in the next to the last fold, a random width fold to accommodate for charts of different lengths and so that a chart of any length will have its right hand edge even with the fold lines at one side of the chart.

A further object of this invention is to provide an improved chart folding device incorporating a pair of adjustable stop elements and a fold element disposed therebetween on a substantially flat base, one of the stop elements being positioned with respect to the fold element so as to achieve a uniform width of folded sheet and the other stop element being so positioned with respect to the fold element as to position the chart or the next to the last or random width fold and present a guide for such fold.

A further object of this invention is to provide an improved assembly of the character described consisting of a flat base element having adjacent one end thereof a first stop element and adjacent the other end thereof a second stop element and intermediate the stop elements a fold guide element, there being a holding element on one of the stop members for holding one end of an elongate chart thereunder to pass beneath the guide element for folding along one edge thereof and the stated fold edge of the fold element being positioned a predetermined distance from the other stop element to form a guide for the next fold on the chart and to permit the next to the last fold on the chart to be of random width so that the right hand edge of the chart will be even with one series of fold lines of the folded chart.

With the above and other objects in view, the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended, it being understood the various changes in the form, proportions, and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:

Fig. 1 is a plan view of the improved chart folding mechanism;

Fig. 2 is a longitudinal section of the folding mechanism taken substantially along the plane of section line 2—2 in Fig. 1;

Fig. 3 is an enlarged transverse sectional view taken along the plane of section line 3—3 in Fig. 1;

Fig. 4 is a diagrammatic end view illustrating a binder or folder having a folded chart disposed therewithin;

Figs. 5, 6, 7 and 8 show progressive stages of folding a chart and illustrate the method by which the charts are folded in the uniform and consistent manner.

Referring at this time more particularly to Fig. 1, reference numeral 10 indicates a base plate formed from any convenient element having a substantially flat upper face and along one side of which is positioned a guide rail element 11 which is of strap-like configuration and which is preferably firmly anchored to the base 10 by means of a series of fasteners 12 or the like. The inner edge 13 of the guide rail 11 is straight and affixed in spaced parallel relationship thereto, upon the base 10, are a pair of guide straps 14 and 15, each secured to the base by suitable fasteners 16 and 17 and the straps having the straight inner edges 18 and 19 parallel to the inner edge 13 of the guide rail 11. Disposed between the guide rail 11 and the guide strap 14 is an elongate stop plate 20 having straight, parallel opposite end edges abutted against corresponding straight edges 13 and 18 such that the stop plate is guidably received therebetween and is permitted of limited sliding movement longitudinally of the guide rail 11. For this purpose, the stop member 20 is provided with a pair of transversely elongate slots 21 and 22 and cooperating therewith are a pair of lock screws having enlarged head portions 23 and 24 so that when these lock screws are tightened, the stop element 20 will be held rigidly affixed to the base 10 and in such position to which the plate is adjusted.

Adjacent the opposite end of the guide rail 11 is a further stop element 25, this element also having the transversely elongate slots 26 and 27 therein and associated lock screws 28 and 29 to adjustably hold the same in fixed position relative to the base 10 and being guidably received between the straight edge 13 and the associated edge 19 of the strap 15.

The stop element 25 is provided with a spring clip element 30 which is rigidly affixed thereto as by the rivets 31 and 32, see particularly Fig. 2. The spring clip is provided with a lever portion 33 which extends angularly upwardly as shown most clearly in Fig. 2 and is provided with a bent back intermediate portion 34 which normally engages the upper surface of the base 10 to clampingly engage the chart or sheet as hereinafter set forth and terminates at its opposite end in the tongue 35 which is affixed to the upper surface of the stop element 25.

The other stop element 20 is also provided with a spring clip element 36 having the lever portion 37, the reversely bent clamping portion 38 and the tongue portion 39 which is swivelly affixed to the upper surface of

the stop element 20 by means of a suitable lock bolt or screw 40. The spring clip 36 may be moved between the out-of-the-way position shown in Fig. 1 to the operative position shown in Fig. 2, the latter position being one in which it is operatively associated with the sheet or chart to clamp the same in position as will be described more clearly hereinafter.

Fixed to the base 10 intermediate the stop elements 20 and 25 is a flexible folding guide or blade 41 which is of generally rectangular form and which is rigidly affixed to the base 10 at one end thereof by means of a suitable mounting element 42 which is, in turn, fastened to the base 10 by means of the fasteners 43, the opposite end 44 of the blade being disposed under member 11 and provided with a shim so as to clear the upper surface of the base 10 by an amount, say .040", to permit paper to pass thereunder.

Figs. 5–8 inclusive illustrate the use of the assembly shown more particularly in Figs. 1–3. In Fig. 5 for example, the reference character C indicates a chart positioned with its left hand edge beneath the spring clip 30 and against the inner edge 45 of the guide member 25, which edge is disposed at right angles to the inner edge 13 of the guide rail 11. The chart is passed under the blade 41 as previously described and the edge 46 of the blade 41 is parallel to the edge 45 of the stop member and disposed also at right angles to the inner edge of the guide rail 11 and forms a folding guide for the chart, the same being folded over upon the blade as is shown in Fig. 6 and suitable means such as a straight edge 47 being utilized to provide a sharp crease at that point. In the second stage of folding, the chart is passed in the opposite direction from that shown in Fig. 6 and a second fold made at a point immediately adjacent to the spring clip 30 and along the fold line 48 shown in Fig. 7, which point may be marked on the rail element 11. The next fold is once again along the line corresponding to the blade edge 46 and so on until the chart is of a length just slightly longer than to extend past the inner edge 49 of the second stop element 20 but yet not sufficiently far past this edge to provide a full fold width. At this point, the right hand edge R of the chart is placed against the stop edge 49 and the spring clip 36 swung into position to clamp this right hand edge against the base 10 and to retain the same against the stop element edge 49, this edge 49 being parallel to the edges 45 and 46 previously described. This position of the chart dictates the width of the random width, next to the last fold, the fold 50, see Fig. 7, having last been made and the portion 51 of the chart remaining between this fold and the edge 49 is smoothed out up to the fold line 50 and then the remaining portion looped therebeyond and then folded or creased with the straight edge 47 as is shown in Fig. 7, leaving that portion of the chart from the front line 50 to the edge 49 to be folded to provide two more widths of the sheet corresponding to the distance between the edges 48 and 50. That is to say, the distance between the edge 46 and the edge 49 is twice the distance between the edge 46 and the fold line 48. Fig. 8 shows the finished form of the chart. It is to be noted that the initial fold is such as to leave a portion P of the chart of slightly greater length than the remaining folded portion thereof, the purpose of this is to permit the chart to be positioned within a binder B as is shown in Fig. 4. Fig. 4 illustrates the position of the chart within a binder and in this figure, the right hand edge of the chart is clearly indicated as is the lefthand edge thereof, with the next to last or random width fold indicated generally by the reference character 52. The fold being formed in Fig. 7 is indicated by the reference character 53 and the next fold to be made is at the line 54 as the remaining portion 51, in Fig. 7, of the chart is passed back over to overlie the already folded portion thereof and creased along the edge 46 defined by the blade 41 and the last fold is represented by the reference character 55 and in this particular case is made coextensive with the fold line 48 and, of course, the first fold, shown being made in Fig. 6, is indicated by the reference character 56.

From the above, it will be readily apparent that no matter what the original length of the chart C, the same may always be folded in such a fashion to provide a series of full width folded sheets and with the last sheet thereof, as indicated by the reference character L in Fig. 4, being of full width and the one which normally carries the title or description of the chart thereon and with the next to the last folded portion, indicated by the reference character 52, being of random width, dependent upon the original length of the chart. Of course, it is possible that a chart be of such initial length as to require no random width fold but in all other cases, the random width fold will compensate for the disparity in length of the chart and will permit the right hand edge R of the chart to lie even with the edges defined by the folds 50, 54, 56, etc. and with the opposite folds 48, 55, etc. lying also in even position so that a neatly folded chart assembly is achieved.

To accommodate for different widths of folded charts, the stop member 25 may be adjusted back and forth by means of the transverse slots therein and associated lock bolts to vary the distance between the edge 45 and the edge 46 and, of course, at the same time the stop element 20 must also be adjusted such as to accommodate for the difference in folded width, since, as previously described, the distance between the edges 46 and 49 is twice the distance between the edge 46 and the point at which the second fold of the chart is made, the second fold is immediately adjacent to the innermost portion of the spring clip 30.

I claim:

1. A device for folding charts and the like comprising a base having a flat upper surface, a guide rail fixed to said upper surface of the base and presenting an upraised straight edge extending therealong, first and second strap members fixed to said base in spaced relation to each other and to said straight edge, each strap member having an upraised inner edge disposed in spaced, parallel relation to said straight edge of the guide rail, a first stop member of rectangular configuration having its opposite ends engaged against the upraised edge of the first strap member and the upraised edge of said guide rail so as to be slidably guided therebetween in a direction parallel to the said straight edge of the guide rail, a second stop member of rectangular configuration having its opposite ends engaged against the upraised inner edge of the second strap member and the opposed upraised edge of the guide rail so as to be slidably guided therebetween in a direction parallel to said straight edge of the guide rail, means adjustably securing said stop members to the base, said stop members having opposed stop edges disposed in parallel relation to each other and at right angles to said straight edge of the guide rail, a guide blade fixed to said base between said stop members, said guide blade being of rectangular configuration and being fixed to said base at that end thereof remote from said guide rail and being cantilevered from such point of securement to a point disposed closely adjacent to, but spaced from said upraised edge of the guide rail, said guide blade being flexible to permit the insertion of a sheet of material thereunder, a spring clip member fixed to said first stop member upon the upper surface thereof and extending parallel to the straight edge of said guide rail, said first spring clip member being elongated and being fixed to said first stop member such that one end thereof projects beyond said straight edge of said first stop member presenting a guide nose beyond said straight edge of the first stop member, a second spring clip member fixed to said second stop member, said second spring clip member being elongate and being projectable beyond said straight edge of the second stop member and terminating in a nose engageable with said upper surface of said base to

clamp a sheet of material thereagainst, said first spring clip member having its nose portion extending beyond said straight edge of the first stop member disposed in spaced relation above said upper surface of the base and the intermediate portion thereof just adjacent to said straight edge of the first stop member in engagement with the upper surface of said first stop member to clamp a sheet of material thereagainst whereby a marginal end edge of an elongate strip of chart material or the like may be clamped beneath said intermediate portion of the first spring clip with the nose portion thereof which is positioned beyond the straight edge of the first stop member tending to preclude folding of the chart material any closer to the straight edge of the first stop member than such nose and acting to be as a guide, said guide blade presenting a guide edge parallel to and opposed to the second stop member, said guide edge being spaced from

the stop edge of the second stop member by a distance just slightly less than twice the distance from such edge and the stop edge of the first stop member.

2. The assembly as defined in claim 1, wherein said second spring clip member is pivotally secured to said second stop member whereby it may be swung to an out-of-the-way position out of engagement with said upper surface of the base.

References Cited in the file of this patent

UNITED STATES PATENTS

196,075	Connell	Oct. 16, 1877
1,346,109	Astley	July 13, 1920
1,430,911	Linebaugh	Oct. 3, 1922
1,500,658	Strmic	July 8, 1924
2,674,187	Kluge	Apr. 6, 1954