

Sept. 16, 1947.

R. I. RHODES

2,427,420

### FRAME OF SHEET MATERIAL

Filed Sept. 17, 1945

2 Sheets-Sheet 1

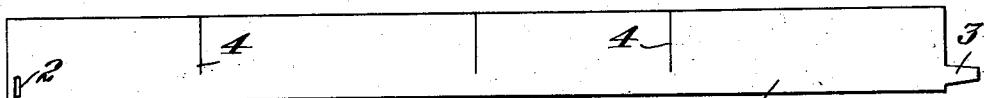


Fig. 1

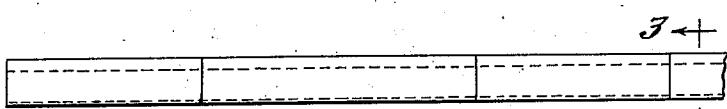


Fig. 2

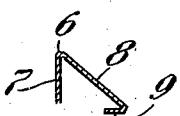


Fig. 3

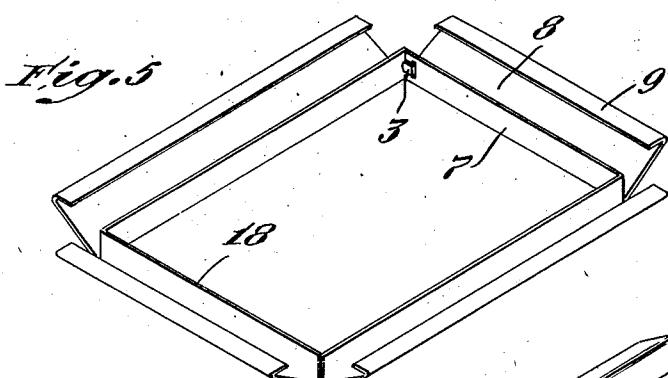


Fig. 5

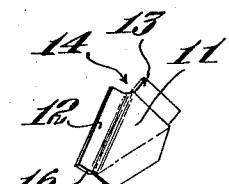


Fig. 4

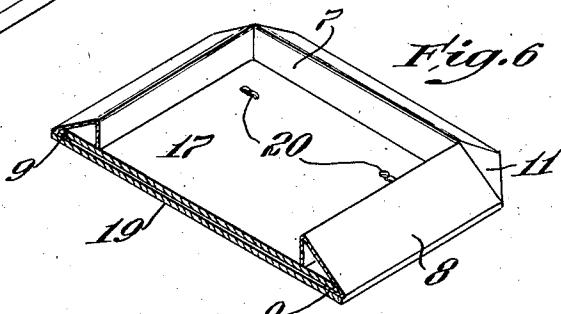


Fig. 6

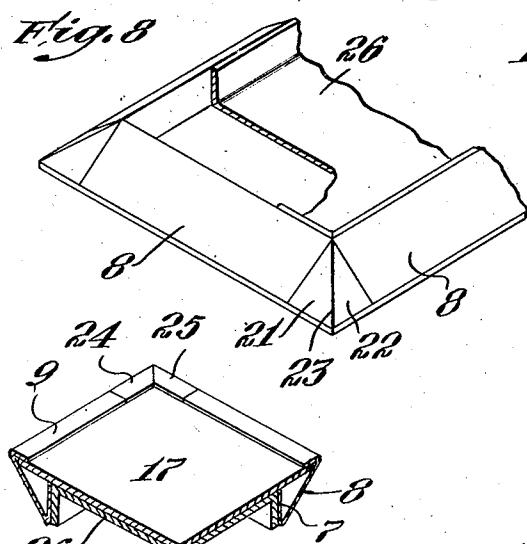
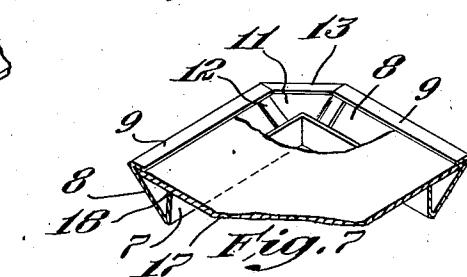


Fig. 9



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Sept. 16, 1947.

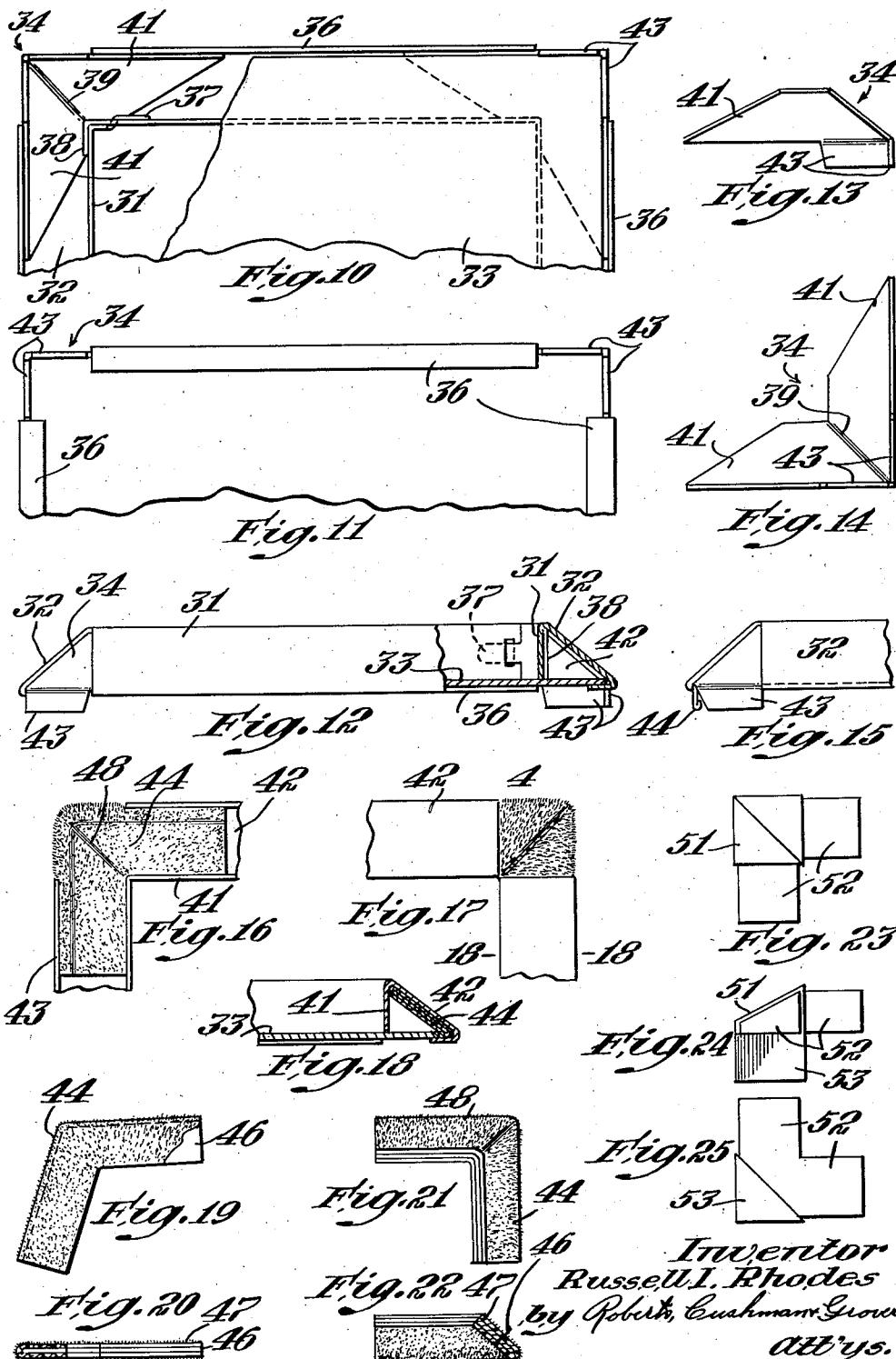
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FRAME OF SHEET MATERIAL

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2 Sheets-Sheet 2



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# UNITED STATES PATENT OFFICE

2,427,420

## FRAME OF SHEET MATERIAL

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Application September 17, 1945, Serial No. 616,853

12 Claims. (Cl. 220—73)

1

This invention relates to frames for boxes, pictures, etc., and more particularly to boxes of the type used for jewelry and the like in which the sides of the box have considerable thickness and which are adapted to receive a pad or cushion to support the piece of jewelry or other article.

Objects of the present invention are to provide a frame which is simple and economical in construction, which is decorative and durable in use and which can be formed in a variety of shapes. Other objects are to provide a method of making frames of the type referred to which requires a minimum number of operations which can be performed either by hand or by machine and which uses inexpensive ribbons of sheet material such as metal, plastic or other stiff sheet material.

According to the present invention the article comprises a polygonal frame comprising inner and outer walls extending along each side of the article with spaces therebetween on different sides of the article, the inner walls being interconnected at the corners and the outer walls having gaps therebetween at the corners. The inner and outer walls may meet and the outer walls are preferably inclined relatively to the inner wall so as to slope outwardly and rearwardly at any desired angle but they preferably meet at an oblique angle. In the preferred embodiment the outer walls have inturned flanges along their outer edges. In certain aspects of the invention it is immaterial how the inner walls are interconnected at their ends, but preferably they are integrally interconnected at all corners except one corner, where a tongue and slot or other means are provided for interconnecting the two walls in assembling the frame. In the preferred embodiment a back seats against the rear edges of the inner walls with its outer margins overlapping the aforesaid flanges at the outer edges of the outer walls.

In a more specific aspect the invention involves corner pieces inserted in the aforesaid gaps and interlocked with the aforesaid walls; preferably by extensions fitting in the aforesaid spaces between the inner and outer walls. While the corner pieces may comprise molded blocks of plastic, wood or the like, they are preferably formed of sheet metal or other sheet material bent so that the aforesaid extensions extend lengthwise of the aforesaid spaces along adjacent sides of the frame. The inner edges of the corner pieces seat against the outer faces of the inner walls and the outer edges of the corner pieces seat against the flanges. Preferably the outer ends of the corner pieces are

2

notched to receive the ends of the aforesaid flanges and when formed of sheet metal they may also be provided with one or more inturned lips. In the preferred construction the aforesaid notches are formed by the junctions of the aforesaid extensions and lips.

In another aspect the invention involves the method of making the aforesaid frame which comprises slitting a strip of sheet metal or other sheet material at intervals corresponding to the lengths of the aforesaid sides to form said gaps, the slits extending transversely of the strip throughout the outer width of the strip corresponding to said outer walls while leaving the strip unslit throughout the inner width corresponding to the inner walls, bending the inner width transversely of the strip at said intervals, bending the outer width outwardly at the junctions between the inner and outer widths, inserting the corner pieces in the corner gaps and interconnecting the ends of the inner width of the strip, and inserting the aforesaid back behind the rear edges of the inner wall with the margins of the back overlapping the aforesaid flanges. While the sequence of the aforesaid steps may be varied, preferably the outer widths of the strip are bent outwardly to form the outer walls before the inner width is bent transversely at the corners, the corner pieces and back are inserted before the free ends of the inner width are drawn together and interconnected, and finally the aforesaid flanges are bent over the back.

For the purpose of illustration typical embodiments of the invention are shown in the accompanying drawing in which

Fig. 1 is a plan view of a strip slit as aforesaid;

Fig. 2 is a similar view after the outer width has been bent outwardly;

Fig. 3 is a section on line 3—3 of Fig. 2;

Fig. 4 is a perspective view of a corner piece;

Fig. 5 is a perspective view of the frame after the inner width of the strip has been bent transversely at the corners and after the free ends of the strip have been interconnected together;

Fig. 6 is a sectional view of the finished article in perspective;

Fig. 7 is a sectional perspective with parts omitted;

Fig. 8 is a perspective view of a modified box showing parts in section;

Fig. 9 is a sectional perspective of the box shown in Fig. 8 viewed from the opposite side;

Fig. 10 is a bottom view of a modification, with

a part of the back broken away, before the aforesaid flanges are bent over the back;

Fig. 11 is a similar view after the flanges are bent over;

Fig. 12 is a side view of the same modification with parts broken away;

Fig. 13 is a side view of a corner piece of the modification shown in Figs. 10 to 12;

Fig. 14 is a bottom view of the same corner piece;

Fig. 15 is a view like Fig. 12 showing a further modification;

Figs. 16, 17 and 18 are bottom top and sectional views of another modification;

Figs. 19 and 20 are plane and edge views of a corner of the modification shown in Figs. 16 to 18 before the piece has been bent as aforesaid;

Figs. 21 and 22 are similar views after the piece has been bent; and

Figs. 23, 24 and 25 are top, side and bottom views of a corner piece in the form of a solid block instead of bent sheet material.

In the particular embodiments of the invention chosen for the purpose of illustration each frame is made from a strip of thin sheet metal or other stiff material 1. In cutting the strips a slot 2 is formed on one end and a tongue 3 on the other end. Slits 4 are formed in one side of the strip either in the operation of cutting out the strip or in a subsequent operation. After the blank has been cut to the form shown in Fig. 1 it is bent along the line 6 extending longitudinally of the strip through the inner ends of the slits 4 to form inner walls 7 and outer walls 8. Either in the same or a subsequent operation in-turned flanges 9 are formed on the outer edges of the outer walls 8. Either before or after these bending operations but preferably before, the inner width of the strip is bent transversely at the slits 4 to form the corners of the box. Subsequently the free ends of the inner width are interconnected by inserting the tongue 3 through the slot 2 and bending over the end of the tongue (Fig. 5).

The corner piece 11 shown in Fig. 4 has lateral margins 12 adapted to extend along the inner faces of the outer walls 8 and a lip 13 at the outer end which is adapted to be folded inwardly to the position shown in Fig. 7. At the outer corners of the piece 11 notches 14 are defined by the margins 12 and the lip 13. In fitting the corner piece into a gap at a corner of the frame the margins 12 seat against the inner faces of the outer walls 8, the inner edge 16 seats against the junction between the inner wall 7 and the outer walls 8, the notches 14 receive the ends of the flanges 9 and the lip 11 is folded into the same plane as the flanges 9 (Fig. 7).

As shown in Figs. 6 and 7 a back 17 may be fitted under the flanges 9 of the outer walls 8 with its front face seating against the read edges 18 of the inner walls 7. If desired a second back 19 may be applied over the back 17 to cover the flanges 9 and the lips 13. The two backs may be formed of cardboard or other suitable material and they may be connected together in any suitable way as by means of rivets 20. In assembling the frame the corner pieces 11 and the back 17 are inserted before the free ends of the inner width of the strip are brought together and secured together by means of the slot 2 and tongue 3. If desired the outer walls 8 are folded outwardly about the line 6 only part way before the corner pieces 11 and the back 17 are inserted in place, in which case the ends of the inner width

may be brought together and secured by the tongue and slot either before or after the corner pieces and the back 17 are put in place.

The modification shown in Figs. 8 and 9 is like that shown in the preceding figures except in that the corner pieces are V-shaped in cross-section with two faces 21 and 22 respectively disposed in planes parallel to the planes of the adjacent outer walls 8 and with a ridge 23 between the two faces and with two lips 24 and 25 instead of the one lip 13 of the first embodiment. In the second embodiment a liner 26 is fitted into the frame. In each embodiment the corner pieces may be shaped completely before they are inserted. However the lips 13, 24 and 25 are preferably bent over the backs 17 after the parts are assembled together.

The modification shown in Figs. 10 to 14 comprises inner and outer walls 31 and 32, a back 33 and corner pieces 34, the outer walls having flanges 36 bent under the margins of the back to hold the back against the rear edges of the inner walls 31. As shown in Figs. 10 and 12 one inner wall has a tongue 37 extending through a slot in the adjacent wall but unlike the first embodiment the tongue and slot connection is offset from the corner and the wall containing the slot has an extension 38 bent around the corner, thereby affording a construction which is firmer and more secure. Preferably the flanges 36 are not bent inwardly until the back has been inserted and the tongue and groove connection has been made, but the flanges may be slightly inclined inwardly so that they may all be simultaneously bent over the back by a flat die plate pressed forwardly thereagainst.

The corner pieces 34 of the modification of Figs. 10 to 14 is similar to those shown in Figs. 8 and 9. As shown in Figs. 13 and 14 each corner 40 comprises an L-shaped piece of sheet material bent at 39 so that the extensions 41 extend lengthwise of the spaces 42 between the inner walls 31 and outer walls. Instead of folding the lips 43 over the back they may be used as legs as shown in Fig. 12; and as shown at 44 in Fig. 15 their edges may be curled.

In the modification shown in Figs. 16 to 22 the frame comprises inner and outer walls 41 and 42 with flanges 43 on the outer walls, as in the preceding embodiments. However each of the corner pieces 44 comprises a layer 46 of cardboard or other sheet material covered with a layer 47 of plush or other finishing material. Preferably the outer layer 47 is folded over the outer edge of the inner layer 46 and cemented to both sides of the inner layer. As shown in Fig. 19 the angle between the two extensions of the corner piece is somewhat greater than a right angle so that, when bent at 48 as shown in Figs. 16 and 21, the two extensions are parallel to the adjacent sides of the frame respectively.

The modified corner pieces shown in Figs. 23 to 25 comprise blocks 51 of plastic or other suitable material having extensions 52 adapted to fit into the aforesaid spaces between inner and outer walls and legs 53 corresponding to the legs 43 of Figs. 10 to 15.

From the foregoing it will be evident that this construction is economical and attractive. It 70 will also be noted that the frame itself has inner walls 7 so that it is unnecessary to provide a liner such as 26 which has side walls.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and

equivalents which fall within the scope of the appended claims. For example the method claims are not to be limited to the particular sequence recited therein.

I claim:

1. An article of the character referred to comprising a polygonal frame and corner pieces, the frame comprising inner and outer walls extending along each side of the article with a space therebetween, the inner walls being interconnected at the corners and the outer walls having V-shaped gaps therebetween at the corners, and corner pieces inserted in said gaps, the corner pieces being interlocked with the walls.

2. An article of the character referred to comprising a polygonal frame and corner pieces, the frame comprising inner and outer walls extending along each side of the article with spaces therebetween, the inner walls being interconnected at the corners and the outer walls having V-shaped gaps therebetween at the corners and inturned flanges along their outer edges, and angular corner pieces bridging said gaps with lateral extensions in said spaces, the inner edges of the corner pieces seating against the outer faces of the inner walls and the outer edges of the corner pieces seating against said flanges.

3. An article of the character referred to comprising a polygonal frame and corner pieces, the frame comprising inner and outer walls extending along each side of the article with spaces therebetween, the inner walls being interconnected at the corners and the outer walls having V-shaped gaps therebetween at the corners and inturned flanges along their outer edges, and angular corner pieces bridging said gaps with lateral extensions in said spaces, the inner edges of the corner pieces seating against the outer faces of the inner walls and the outer edges of the corner pieces seating against said flanges, said corner pieces being formed of sheet material bent so that said extensions extend lengthwise of said spaces along adjacent sides of the frame.

4. An article of the character referred to comprising a polygonal frame and corner pieces, the frame comprising an elongate strip of sheet material including inner and outer walls extending along each side of the article with a space therebetween, the inner walls being integrally interconnected at all corners except one corner, means interconnecting the inner walls at said one corner, the outer walls being inclined relatively to the inner walls so as to slope outwardly and rearwardly and having V-shaped gaps therebetween at the corners, and corner pieces inserted in said gaps, the corner pieces being interlocked with the walls.

5. An article of the character referred to comprising a polygonal frame and corner pieces, the frame comprising an elongate strip of sheet material including inner and outer walls extending along each side of the article with spaces therebetween, the inner walls being integrally interconnected at all corners except one corner, means interconnecting the inner walls at said one corner, the outer walls having gaps therebetween at the corners and inturned flanges along their outer edges, and angular corner pieces bridging said gaps with lateral extensions in said spaces, the inner edges of the corner pieces seating against the outer faces of the inner walls and the outer edges of the corner pieces seating against said flanges.

6. An article of the character referred to comprising a polygonal frame and corner pieces, the

frame comprising an elongate strip of sheet material including inner and outer walls extending along each side of the article with spaces therebetween, the inner walls being integrally interconnected at all corners except one corner, means interconnecting the inner walls at said one corner, the outer walls having gaps therebetween at the corners and inturned flanges along their outer edges, and angular corner pieces bridging said gaps with lateral extensions in said spaces, the inner edges of the corner pieces seating against the outer faces of the inner walls and the outer edges of the corner pieces seating against said flanges.

7. An article of the character referred to comprising a polygonal frame and corner pieces, the frame comprising an elongate strip of sheet material including inner and outer walls extending along each side of the article with spaces therebetween, the inner walls being interconnected at the corners and the outer walls having gaps therebetween at the corners and inturned flanges along their outer edges, angular corner pieces bridging said gaps with lateral extensions in said spaces, the inner edges of the corner pieces seating against the outer faces of the inner walls and the outer edges of the corner pieces seating against said flanges, said corner pieces being formed of sheet material bent so that said extensions extend lengthwise of said spaces along adjacent sides of the frame.

8. An article of the character referred to comprising a polygonal frame and corner pieces, the frame comprising an elongate strip of sheet material including inner and outer walls extending along each side of the article with spaces therebetween, the inner walls being interconnected at the corners and the outer walls having gaps therebetween at the corners and inturned flanges along their outer edges, angular corner pieces bridging said gaps with lateral extensions in said spaces, the inner edges of the corner pieces seating against the outer faces of the inner walls and the outer edges of the corner pieces seating against said flanges, and a back having its front face seating on the rear edges of the inner walls and its rear face overlapping the forward faces of said flanges.

9. An article of the character referred to comprising an elongate strip of sheet material having its inner elongate marginal edge bent longitudinally at an angle to its outer longitudinal marginal edge, the outer marginal edge having inwardly extending slits, the inner marginal portion being bent transversely along lines in alignment with said slits to define a polygonal shaped frame having V-shaped gaps at each corner, and corner pieces inserted in said gaps, the corner pieces being interlocked with said frame.

10. An article of the character referred to comprising a polygonal frame and corner pieces, the frame comprising an elongate strip of sheet material including inner and outer walls extending along each side of the article with spaces therebetween, the inner walls being interconnected at the corners, the outer walls having gaps therebetween at the corners and inturned flanges along their outer edges, and angular corner pieces bridging said gaps with lateral extensions in said spaces, the inner edges of the corner pieces seating against the outer faces of the inner walls and the outer edges of the corner pieces seating against said flanges.

the outer edges of the corner pieces seating against said flanges.

11. An article of the character referred to comprising a polygonal frame and corner pieces, the frame comprising an elongate strip of sheet material including inner and outer walls extending along each side of the article with spaces therebetween, the inner walls being interconnected at the corners, the outer walls having gaps therebetween at the corners and inturned flanges along their outer edges, and angular corner pieces bridging said gaps with lateral extensions in said spaces, the inner edges of the corner pieces seating against the outer faces of the inner walls and the outer edges of the corner pieces seating against said flanges, said corner pieces being formed of sheet material bent so that said extensions extend lengthwise of said spaces along adjacent sides of the frame.

12. An article of the character referred to comprising an elongate strip of sheet material having its inner elongate marginal edge bent longitudinally at an angle to its outer longitudinal marginal edge, the outer marginal edge having inwardly extending slits, the inner marginal portion being bent transversely along lines in align-

ment with said slits to define a polygonal shaped frame having V-shaped gaps at each corner, and means interconnecting the ends of the inner marginal portion at one corner of the frame.

RUSSELL I. RHODES.

#### REFERENCES CITED

The following references are of record in the file of this patent:

#### UNITED STATES PATENTS

	Number	Name	Date
	1,256,993	Eidlitz	Feb. 19, 1918
	1,513,050	Kristofek	Oct. 28, 1924
15	2,085,460	Williams	June 29, 1937
	1,453,727	Pumphrey	May 1, 1923
	1,492,951	Auerbach	May 6, 1924
	2,146,318	Viscount	Feb. 7, 1939
	2,216,147	Ward	Oct. 1, 1940
20	1,708,615	Groehn	Apr. 9, 1929
	1,934,220	Willson	Nov. 7, 1933
	2,225,110	Hearn	Dec. 17, 1940

#### FOREIGN PATENTS

	Number	Country	Date
25	146,921	Germany	Jan. 19, 1904