March 3, 1942. I. C. RINN 2,274,808

BITE WING FOR DENTAL FILM PACKS AND THE LIKE

Filed Jan. 7, 1941

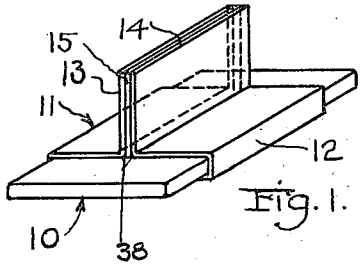

Fig. 1.

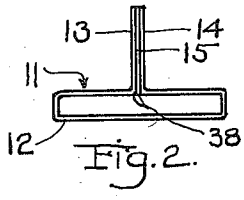

Fig. 2.

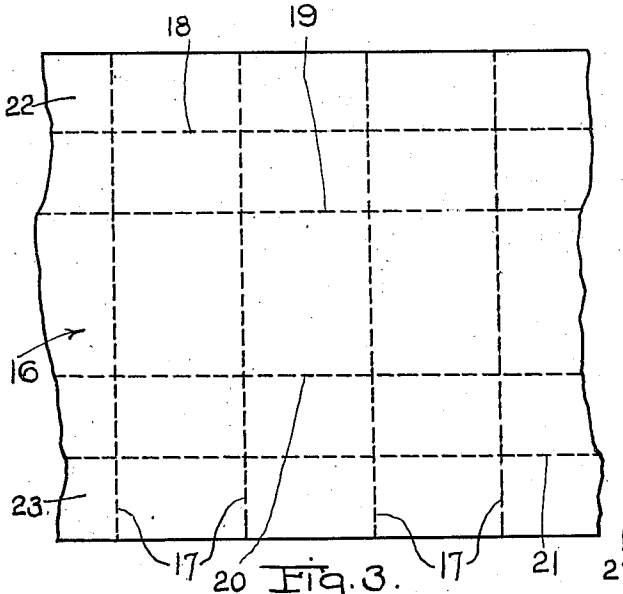

Fig. 3.

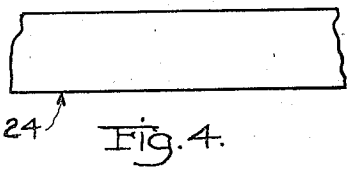

Fig. 4.

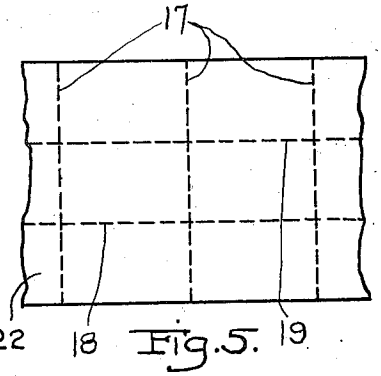

Fig. 5.

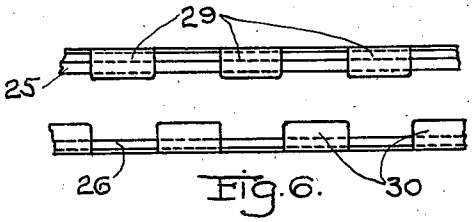

Fig. 6.

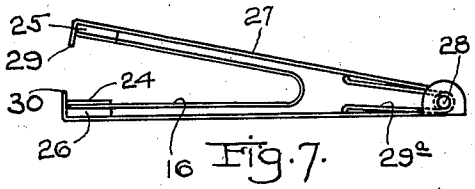

Fig. 7.

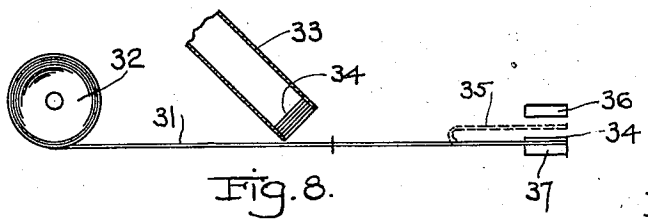

Fig. 8.

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BITE WING FOR DENTAL FILM PACKS AND THE LIKE

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2 Claims. (Cl. 250—69)

This invention relates to improvements in what are known as bite-wings for dental film packs, and the like. These bite-wings are intended to be received and held between the teeth of a dental patient to hold a film pack in proper position within the mouth and behind the teeth during an X-ray operation. Various forms of such bite-wings have been provided in the past, some of which are shown, for example in Letters Patent of the United States, No. 1,467,876, issued September 11, 1923 to Raper. One form of such previously known bite-wing arrangements comprising a band of Celluloid intended to receive the body of the film pack and hold the same with sufficient firmness to make possible the carrying out of the X-ray exposure, said band being provided with a distinct portion connected to the band and intended for use as the bite-wing proper. That form of arrangement, however, presents the serious objection, among others, that it entails greatly exaggerated manufacturing costs, and that it does not present a completely integrally formed article.

The main feature and object of the present invention is to provide a bite-wing comprising a single strap and lug portion adapted to completely encircle the film pack proper, and to also provide the lug portion which is taken between the teeth of the patient, together with a greatly improved means for forming said lug portion. This lug portion, according to my present invention comprises the end portions of the strap which are brought together face to face or into parallel relationship, and are cemented together either directly or through the medium of an intermediate insert; but in either case the lug and strap constitute one integral portion, with manufacturing advantages which will presently become apparent.

A further feature of my present invention relates to the provision of such a bite-wing arrangement as above referred to, and in which the cementing of the two end portions of the strap together is effected by the use of cementing agent having the property of effecting its cementing functions entirely by application of heat and pressure to the parts; said cementing agent being dry and non-tacky at ordinary temperatures, and effecting its cementing function when located between the surfaces to be joined together and there subjected solely to the action of heat and pressure.

A cementing agent responding to the above requirements comprises a stretchable base film comprising a wax and rubber and having an adherent flexible non-tacky coating such as disclosed in Letters Patent of the United States, No. 2,078,172, issued April 30, 1937; or a heat sealing composition comprising 70–94% of paraffin wax having a tensile strength of from 40 to 300 lbs. sq. in., and a melting point of from 120–140 degrees Fah., 6–30% of pale crepe rubber, said composition having imparted thereto a viscosity of at least 8000 secs. (Scott), and being adapted to form moisture proof, waterproof, non-tacky, elastic and flexible films which remain flexible at low temperatures, as disclosed, for example, in Letters Patent of the United States, No. 2,054,112, issued September 15, 1936; but I wish it distinctly understood that by mentioning the foregoing specific examples of a suitable cementing agent for uniting the end portions of the strap together I do not intend to limit myself to such specific materials, except as I may do so in the claims to follow.

Still, it will be understood that materials such as the foregoing are peculiarly adapted to the present use, that is, in the formation of these bite-wings for dental X-ray film packs. It will be understood that these articles are inserted and held in the mouth of the patient during the X-ray exposure; that during such exposure the moisture and saliva of the mouth must not cause the cementing agent to become loosened to any degree; that such cementing agent must not be to any extent deleterious to the health of the patient; that such cementing agent must be one which may be readily applied to the strap ends during manufacture of the bite-wings; and above all, such cementing agent must be one which is substantially transparent to the X-rays, since during the exposure the said X-rays come from the outside of the mouth and through a substantial portion or all the length of the bite-wing, and any opaqueness of the material of the bite-wings lugs themselves, or of the cementing agent, will cause serious clouding of the image formed on the film.

I have found that cementing agents such as heretofore mentioned comply admirably with all the foregoing requirements as well as others, and especially that said cementing agents are substantially completely transparent to the X-rays, and therefore meet this prime requirement of a satisfactory cementing agent for this purpose.

In the practical application of such cementing agents to the production of these band or strap bite-wings, I sometimes make use of a layer of double-coated paper or the like, set between the two end portions of the strap, and cemented to

said end portions by application of heat and pressure. Or, sometimes I cement the bite-wing lugs directly together face to face by use of such cementing agents as herein contemplated, by application of such agents directly to the face of the strap and without interposition of a separate or special additional layer of material. Such arrangements lend themselves admirably to rapid production of these bite-wings in large quantities; and in this connection it is a further object of the invention to make provision for production of the strap bite-wings in quantities by production arrangements wherein a number of complete bite-wings units may be produced as a strip, with tear lines between individual units, so that these units may be separated from each other after completion of the manufacturing operations and processes.

It is therefore a further object to provide a new and improved method or process for manufacture of the bite-wings in large quantities by simple operations, with substantially no waste of the raw materials, and at very low cost of production.

Other objects and uses of the invention will appear from a detailed description of the same, which consists in the features of construction, and combinations of parts, and methods or processes of manufacture hereinafter described and claimed.

In the drawing:

Figure 1 shows a perspective view of a typical form of film pack, having applied thereto a strap bite-wing embodying the features of the present invention;

Figure 2 shows an end view of the strap bite-wing removed from, or prior to application to, the film pack;

Figure 3 shows a sheet of paper stock suitable for production of a number of the strap type bite-wings according to the features of the present invention;

Figure 4 shows a strip of the double-coated paper stock or the like, having both its faces treated with the cementing agent of heat and pressure cementing qualities, and adapted for placement between the edge portions of the folded strip of Figure 3 material, to produce a strip of connected bite-wings;

Figure 5 shows the strip of Figure 3 folded over with the strip of Figure 4 located between the so-folded edge portions, and preparatory to the cementing action by application of heat and pressure;

Figure 6 shows a front face view of a simple form of press for treatment of the strips of form of Figure 5 to produce the cementing action by heat and pressure;

Figure 7 shows an end view corresponding to Figure 6; and

Figure 8 shows more or less schematically a production line for production of individual bite-wings embodying the features of the present invention, as distinguished from production of these bite-wings in strips.

Referring first to Figure 1, I have therein shown a bite-wing embodying features of the present invention and applied to a typical film pack. In this case the film pack is designated in its entirety by the numeral **10**. It is relatively thin, and somewhat longer than broad. The bite-wing in its entirety is designated by the numeral **11**. It comprises a strap **12** of paper stock or the like, having its end portions **13** and **14** brought together face to face as well shown in Figures 1 and 2, and cemented firmly in such relation; and due to the fact that the entire facial areas of these end portions may thus be cemented togeter it follows that a very strong securing action may thus be ensured. Sometimes such cementing action is produced by interposition of a distinct layer or sheet of paper stock material such as **15** between the said lug or end portions **13** and **14**, said layer or strip **15** being treated on both its faces with the cementing agent of the type hereinbefore referred to, so that by pressing the lug or end portions **13** and **14** towards each other with application of heat there will occur the cementing action of both these lugs to this intermediate layer or sheet. Such arrangement constitutes a very simple and effective means to secure the desired connection between the lugs, and without the need of specially treating the faces of the lugs of the strap itself with the cementing agent.

It is noted that the strap type bite-wing formed as just above explained comprises a strap of paper stock which is of course flexible to the extent that such strap may be flexed to place it over the body of the film pack as shown in Figure 1; and when the bite-wing is removed from the film pack, or prior to application to the film pack, the bite-wing may be folded into a double thickness unit.

Referring now to Figures 3, 4 and 5 I will explain a simple means for production of the complete bite-wings in quantities and at very low cost. In this case I take a band of the suitable paper stock **16**, of width equal to the length of the strap **12** of the bite-wing, including the lugs **13** and **14** thereof; and preferably I score or otherwise produce the tear lines **17** across this band **16**, such tear lines being spaced from each other distances equal to the widths of the bite-wing straps to be produced. That is, the distance between two of the tear lines **17** is equal to the width of the bite-wing strap (parallel to the length of the film pack).

I may also, if desired, provide other score lines **18**, **19**, **20** and **21** lengthwise of the band **16**; the lines **18** and **21** corresponding to the lines of fold at the locations where the lugs **13** and **14** reach outwardly from the body of the bite-wing strap; and the lines **19** and **20** corresponding to the locations where the bite-wing strap bends or turns over the edges of the film pack when placed over the same. In other words, the score lines **18** and **21**, when used, define edge strips **22** and **23** along the edges of the band **16**, and these edge strips will produce the lugs **13** and **14** of the individual bite-wings.

I may then provide a strip **24** of double-coated paper stock material having its faces treated with the cementing agent; said strip **24** being of the same width as the strips **22** and **23**, so that by laying this strip **24** over one of the strips **22** or **23**, and then folding the body of the band **16** over to bring its other strip **22** or **23** as the case may be into face contact with such strip **24**, it is then possible to subject these strips **22** and **23** to heat and pressure with the strip **24** between them, so that the faces of said strip **24** are cemented very firmly to the faces of the strips **22** and **23**, and a folded band such as shown in Figure 5 is produced. Thereafter it is a simple matter to detach the individual bite-wings from each other by tearing on the lines **17**.

Referring now to Figures 6 and 7 I have therein shown a simple form of press for individually

treating bands of the form of Figure 3 to cement their edge portions together, thereby making it possible to produce a large number of the bite-wings (for example 18) at each heating and pressing operation, with corresponding great economies of production. This press includes the parallel heating plates 25 and 26, these being of length to correspond to the length of band 16 which is to be received and treated. The heating plate 26 is stationary; and the heating plate 25 is vertically movable, being carried by the arm arrangement 27 and journalled to swing up and down on the axis 28. A spring 29a may conveniently be provided to raise this arm into the position of Figures 6 and 7. There are also conveniently provided the guide fingers 29 and 30 on the front edges of the heating plates 25 and 26, respectively, said fingers of the two plates intermatching so that when the upper heating plate is forced down its fingers match between those of the lower or stationary heating plate.

The folded (but preferably not creased) band 16 is set into place between the heating plates as shown in Figure 7, bringing its edges against the inner faces of the fingers 29 and 30, so as to correctly place said edges, and then the strip 24 of double-coated material is set into place on the upper face of the edge portion which lies on the lower or stationary heating plate, as shown in Figure 7; and then the upper heating plate is forced down firmly to bring the edge portion of the band against the top face of the strip 24, thus exerting pressure under heat to force both of the edge portions of the band 16 against the faces of the strip 24. Such pressure and heat action may then be maintained for the proper interval of time to ensure firm cementing of the edge portions of the band to the double-coated strip, whereupon the upper plate may be raised, thereby releasing the completed band which may be removed from the press. The individual bite-wing sections may then be torn apart, each being in complete form.

The foregoing operation contemplates the use of a strip of the double-coated material for sealing the edge portions of a band of paper stock together. A similar operation might also be used wherein the band 16 is made of single-coated stock, having one face coated with the cementing agent which cements under application of heat and pressure, leaving out the intermediate strip of double-coated material. Such scheme is also contemplated herein and intended to be covered hereby. Sometimes it may be desirable to form the bite-wing units individually instead of as a group; or sometimes it may be found desirable to make use of individual pieces or sections of the double-coated material for cementing the end portions of the individual bite-wings together. Referring to Figure 8 I have shown a simple form of machine, more or less schematically, which may perform these operations. In this case the narrow strip of paper stock 31 is drawn from the roll 32 of such stock and feeds towards the right in Figure 8. There is provided a magazine 33 in position to deliver individual small rectangles 34 of the double-coated material into place over the ends of the sections of paper stock cut off from the band 31, as said sections reach the proper location; and thereafter means may be provided for folding over the said sections as shown at 35 and for bringing their end portions, with the intermediate rectangles of double-coated material together, and for subjecting them to heat and pressure by the plates (heated) 36 and 37.

With the foregoing arrangement each bite-wing is formed as a self-contained unit, and use may be made of separate rectangles of the double-coated cementing agent material; but it will also be noted that such operations may also be performed on groups of two, three, four or more bite-wings, instead of on individual units, said groups being afterwards separated from each other and into the individual bite-wing units.

I wish to call attention to the fact that when a bite-wing of this band type is placed in use around the film pack it is customary to exert a pull of the lugs 13 and 14 away from the face of the film pack. Such pull tends to cause the said lugs to draw apart from each other commencing at the inner edge 38 (see Figures 1 and 2) whereupon the effectiveness of the bite-wing to securely hold the film pack in its desired position within the patient's mouth is impaired. Since the bite-wing is subjected to the action of the moisture (saliva) of the patient's mouth, this tendency of the cementing between the lugs to become ineffective at the location 38 is greatly augmented in the case of such materials as glues and the like; and for this additional reason I have found that the use of the cementing agents such as herein disclosed is greatly to be desired for the present work. I have found that this cementing agent will join the lugs 13 and 14 together so effectively, clear down to the line or location 38, that even when subjected to very considerable pulling forces the attachment or cementing together will not be destroyed; and in fact, when the heat and pressure operations are properly performed the fibres of the paper stock material itself will tear or be damaged prior to any tearing apart of the so cemented parts. This fact is to be considered in connection with the fact that these cementing agents are not damaged or impaired by any action of the saliva, so that there is a peculiar effectiveness and desirability for the use of these cementing agents in connection with these bite-wings for insertion and use in the patient's mouth.

It is also to be noted that I may use bite-wing strips having their end portions directly cemented together by such cementing agents as herein disclosed, and without the interposition of an intersheet or layer; and in such case the entire strip of material used for making the bite-wing may be single coated or treated with the cementing agent on only one face, since when it is bent or folded into the strap form these end portions will come together and the treated portions will come together face to face and may be then joined by the use of heat and pressure alone. In either case the degrees of heat to be used and the time interval during which the heat and pressure should be exerted, will depend on the conditions; but generally the time interval will approximate 1 second, and the temperature not over 160 degrees Fahrenheit; but these factors are mentioned merely by way of illustration, and not as a limitation on the use of the invention, except as I may limit myself in the claims.

While I have herein shown and described only certain embodiments of features of my present invention, and only certain methods or processes for carrying it into effect, still I do not intend to limit myself thereto, except as I may do so in the claims.

I claim:

1. In the art of producing continuous strip strap bite-wings comprising straps intended to embrace film packs and lug portions intended to

be received between the patient's teeth, means to produce the same comprising the production of a band of paper stock material of width equal to the length of strip constituting a bite-wing including the lugs thereof and of length equal to the combined widths of a plurality of the bite-wing straps and having score lines extending across said band at spacings equal to the widths of the bite-wing straps, bending said band into a U-shaped loop, placement of a strip of double coated paper stock between the edge portions of said looped band, said strip having a width equal to the length of the lug portion of the bite-wing, and both faces of said strip being treated with cementing agent having the property of cementing upon application of heat and pressure, bringing said edge portions of the looped band into face contact with said double-coated strip, and applying heat and pressure to said edge portions for a width equal to the width of said strip, substantially as and for the purpose set forth.

2. In the art of producing continuous strip strap bite-wings comprising straps intended to embrace film packs and provide lug portions intended to be received between the patient's teeth, those steps comprising preparation of a band of single coated material of paper stock or the like, having a coating of paraffin and rubber like cementing agent on one of its faces adjacent to at least one of its edges and up to a line of joinder of said band, said band being provided with tear lines transversely of the band and separated from each other a distance equal to the width of the strap of the bite-wing to be produced from said band, the width of the band being equal to the length of the strap and lugs of the bite-wings to be produced therefrom, thereafter bringing the edge portions of the band into face to face contact with the said coating of cementing agent between the said edge portions, and thereafter subjecting said edge portions to the action of heat and pressure up to said line of joinder to cement said edge portions together securely up to said line of joinder, and thereafter tearing the individual bite-wings apart along the lines of tear aforesaid, substantially as described.

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