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F. W. HUMPHNER

2,400,995

GUMMED PRODUCT

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Fig. 1

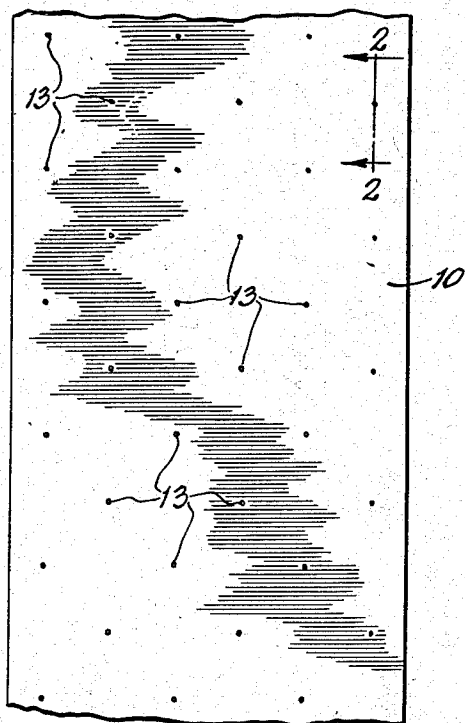


Fig. 3 Fig. 2

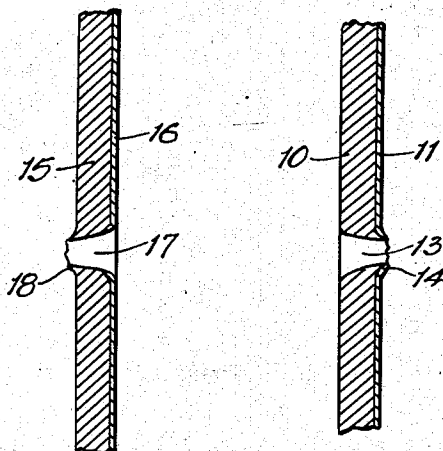


Fig. 4

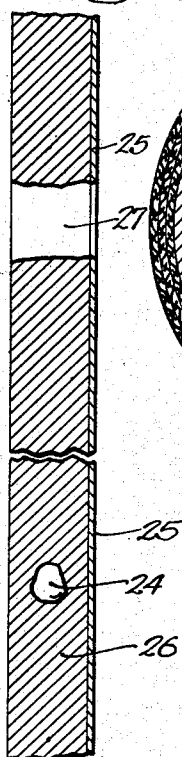
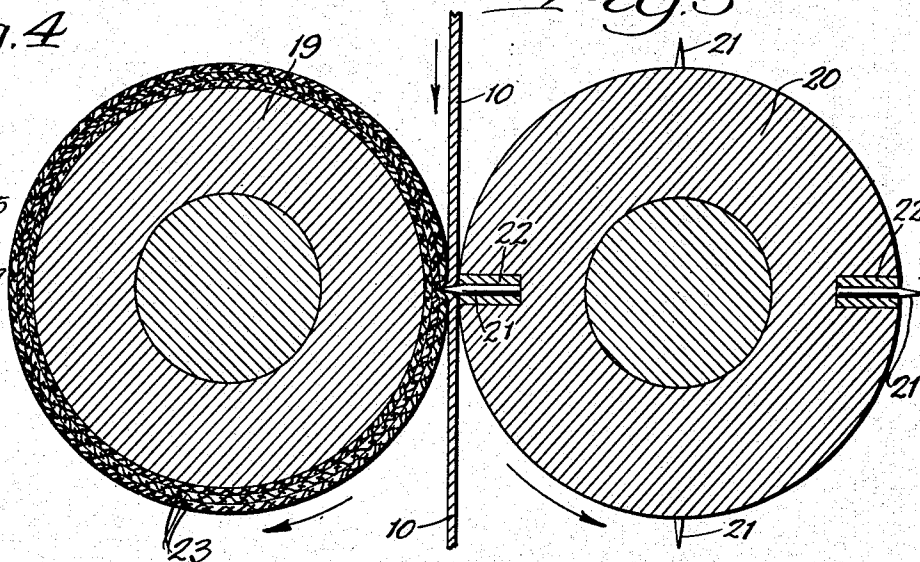


Fig. 5



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UNITED STATES PATENT OFFICE

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GUMMED PRODUCT

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2 Claims. (Cl. 117-122)

This invention relates to a gummed product and methods of preparing the same and more particularly to the providing of a gummed paper or the like having a plurality of small spaced perforations therein.

An object of the invention is to provide a gummed paper or tape which is more adherent to surfaces to which it is applied than the tape which has heretofore been known. Another object is to eliminate the formation of air pockets between the gummed tape and the surface to which it is applied.

Still another object is to provide a gummed product having a base sheet and a layer of adhesive thereon and to provide the product with means for receiving and retaining increased quantities of water when the product is moistened. A further object is to provide increased flexibility in a gummed paper or tape without decreasing the strength of the same.

Other features and advantages will appear from the following specification and drawing, in which—

Figure 1 is a top plan view of a section of gummed tape prepared in accordance with the invention; Fig. 2 is a sectional view taken along the line 2-2 of Fig. 1; Fig. 3 is a sectional view similar to that of Fig. 2 showing a modified form of the product; Fig. 4 is a sectional view similar to that of Figs. 2 and 3, showing another modification of the invention; and Fig. 5 is a transverse sectional view of the apparatus as used in forming the product.

In the embodiment of the invention described herein and shown in Figs. 1 and 2, the gummed product includes a backing sheet 10 which may be of paper, cloth, or other suitable material. On one surface of the backing sheet 10 is a layer 11 of dry remoistening adhesive of any suitable well-known type used in gummed tape products and the like. An animal glue, starch, dextrin, or gum arabic adhesive or mixture of any of these, as well as other conventional and well-known remoistening adhesives, may be used for the layer 11.

The paper backing 10 is equipped with a plurality of small spaced perforations or apertures 13 which extend through the paper sheet 10 and the layer of adhesive 11. The apertures 13, as seen particularly in Fig. 2, may be inwardly tapered toward the adhesive coated surface of the paper. The portion of the adhesive immediately adjacent the apertures 13 may be raised above the surface of the adhesive layer, as seen at 14. As seen in the modified product shown in Fig. 55

3, the sheet of paper 15 and the adhesive layer 16 thereon, may be equipped with apertures 17 which are outwardly tapered toward the adhesive surface of the sheet. In this construction, the portion 18 of the paper immediately adjacent the apertures 17 may project slightly above the exposed surface of the paper sheet 15.

In each instance, the apertures are extremely small and, therefore, possess capillary properties. The apertures may, if desired, be spaced about the surface of the gummed paper or gummed tape in any desired pattern. For example, the apertures may be so spaced and arranged as to form a design consisting of letters, numerals, medallions and the like.

Any suitable method of forming the apertures in the gummed paper or gummed tape may be used. A preferred method of forming the apertures as illustrated in Fig. 5, comprises the passing of the gummed tape 10 between a pair of rollers 19 and 20, the roller 20 being equipped with suitable projecting members 21 for piercing the gummed tape.

The roller 20 is provided with socket means 22 for receiving the base of the projecting needles 21, and the needles 21 are preferably provided with sharp tapered points which are adapted to pass through the gummed tape 10 to form the apertures therein. The needles 21 may be spaced about the roller 20 in any desired arrangement or pattern.

The roller 19 is preferably equipped with a plurality of layers 23 of felt or other soft resilient material extending about the periphery of the roller. The rollers 19 and 20 are disposed in adjacent relation with the point of each of the needles being received within the felt 23 on the roller 19 as the needles pass the closest portion of the roller 19.

The gummed tape 10 is passed between the rollers, preferably with the gummed or adhesive surface in engagement with the roller 19. The rollers may be rotated to move the gummed tape between them or the operation may be carried out in any other suitable manner.

Another method by which the perforations may be produced in the gummed tape consists of depositing small particles 24 of carbon, iron, or a highly ionizable salt, such as sodium chloride, in the paper sheet 26, as seen particularly in Fig. 4. Preferably, the particles are incorporated in the paper sheet at the time that the sheet is formed from the paper pulp. The adhesive is then applied to the sheet in fluid form and dried to form the adhesive layer 25. The particles are

preferably of relatively low electrical resistance so as to produce a lowering of the electrical resistance of the paper at the portions in which the particles are found.

The perforations may be made in the gummed sheet or tape shown in Fig. 4 by passing a high amperage, low voltage electric current through the sheet. The electric current will pass through the portions of the sheet which contain the electrically-conducting particles and will produce small holes 27 in the paper sheet and the adhesive layer thereon. The operation may be carried out in any suitable manner, for example by passing the paper between two electrically-charged plates.

When the gummed tape containing the small capillary perforations is applied to a surface, the gum or adhesive layer is moistened and secured to the surface to which the tape is to be applied. Air which is trapped beneath the surface of the tape in the form of air pockets may readily escape through the perforations in the tape and a complete and continuous contact is made between the tape and the surface to which it is applied.

The improved tape is also advantageous in that the projecting portions of the adhesive of the embodiment of the invention, shown in Fig. 2, are brought into engagement with the moistening means and act as a tread to aid the adhesive surface of the tape in picking up a greater quantity of water from the moistening surface. Similarly, the capillary apertures in the tape receive and retain water by capillary action. The water which is received within the capillary apertures is gradually absorbed by the adhesive layer.

By using a plurality of small perforations

spaced over the surface of the tape, it is possible also to increase the flexibility of the tape without decreasing the strength of the same.

Although the invention has been described in connection with particular embodiments and certain details of structure and method have been set forth for the purpose of illustration, it will be understood that changes and modifications may readily be made in the structure and method without departing from the spirit and scope of the invention.

I claim:

1. A remoistening gummed paper product comprising a paper sheet, and a layer of dry remoistening adhesive on said sheet, said sheet and the adhesive thereon being provided with a plurality of capillary apertures extending therethrough, the adhesive adjacent the apertures being slightly raised above the surface of said layer to act as a tread to aid said surface to pick up a greater quantity of moisture from a moistening surface.
2. A remoistening gummed paper product comprising a paper sheet, a layer of dry remoistening adhesive on said sheet, said sheet and the adhesive thereon being provided with a plurality of capillary apertures extending therethrough, each of said apertures in said sheet being outwardly tapered toward the exposed surface of the sheet and a plurality of small projecting portions in the adhesive immediately adjacent said apertures and extending slightly beyond the surface of the layer to act as a tread to aid said surface to pick up a greater quantity of moisture from a moistening surface.

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