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CLOTH GUMMED TAPE AND PROCESS OF MAKING SAME.
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Fig. 1.

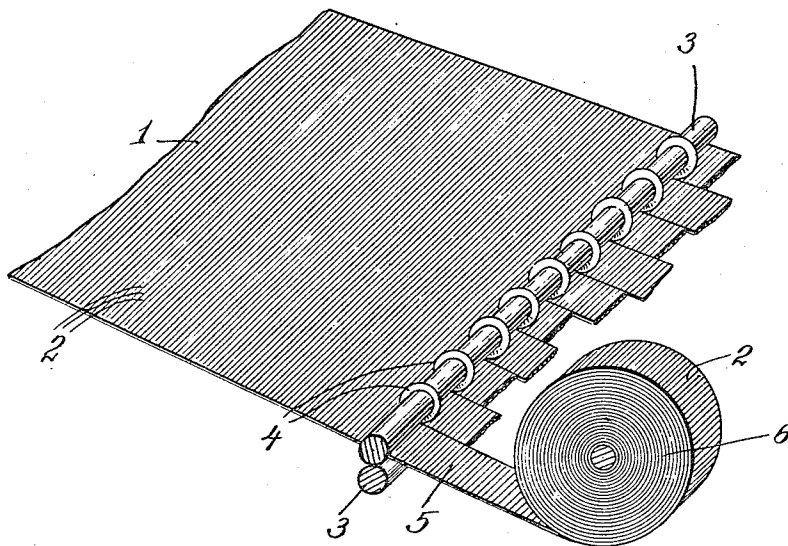
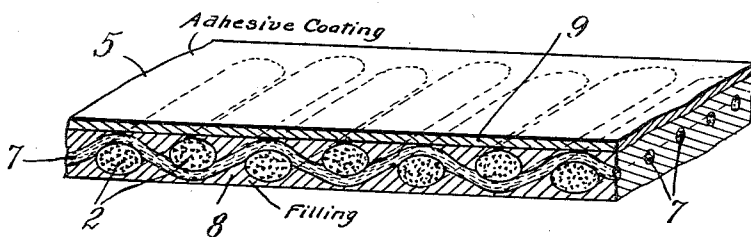


Fig. 2.



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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES H. CROWELL, a citizen of the United States, and resident of the borough of Brooklyn, county of Kings, city and State of New York, have made a certain new and useful Invention Relating to Cloth Gummed Tape and Processes of Making the Same, of which the following is a specification, taken in connection with the accompanying drawing, which forms part of the same.

This invention relates especially to rolls of cloth gummed tape, such as may be used for sealing cartons or packages, or for other purposes, and in which the stronger threads of the cloth are arranged transversely to and preferably substantially perpendicularly to the length of the gummed strips so as to give them a maximum transverse strength. An illustrative though not necessary method of making such gummed tape is to have the cloth from which it is made woven with filling threads which are considerably stronger and preferably also considerably more numerous than the warp threads which may be smaller and also softer and weaker in some cases so as to allow the filling or woof threads to lie substantially straight if the relative tensions or tightnesses of these threads are properly taken care of. Such cloth may be carefully filled if this is desirable and then rendered adhesive by applying a coating of gum or other material to one or both sides thereof before the web of special gummed cloth is slit into long strips of gummed tape which may be wound up into the usual rolls of tape a number of hundred yards long, as is customary for use in moistening machines.

The accompanying diagrammatic drawing shows in Fig. 1 a perspective view of an arrangement for slitting and winding a web of such gummed cloth into rolls; and

Fig. 2 is an enlarged diagrammatic section taken longitudinally of one of these gummed tape strips.

For sealing and other finishing purposes cloth gummed tape does not in many cases need a very high degree of longitudinal strength while its transverse strength is considerably more important because the strip is usually employed to cover a seam extending longitudinally of the strip and to adhesively hold the edges of this seam together. The number and character of the threads extending transversely of the strip

therefore determine its efficiency and strength under such conditions while the longitudinally extending threads are of relatively little importance so long as a fair degree of longitudinal strength is preserved and so long as the strip is not unduly stiffened in this way. Although not necessary a desirable illustrative way of producing such cloth gummed tape having great transverse strength is to make a specially woven fabric in which the filling threads have much greater strength than the warp threads because of their greater number or strength, or both, and then filling and gumming the fabric to form a gummed cloth web which may be slit into endless strips of gummed tape and wound up into rolls of the desired size.

In making cloth gummed tape suitable for ordinary package sealing, warp and filling threads of such size, weight and character as correspond generally to what are used in print cloths may be employed and the filling threads may be given the desired relatively greater strength by making the filling count considerably higher than the warp count and for some purposes the filling count may with advantage be made about twice as great as the warp count in these plain woven cloths, instead of having a higher warp count than filling count as is usual. It is also desirable to use for the filling threads the more closely twisted and therefore stronger threads which are usually employed for warp threads in such grades of cloth, and if desired the warp threads used in weaving the backing fabric for this gummed tape may also be the firmly twisted threads usually employed for warp threads. A satisfactory fabric for this purpose may be produced by weaving thirty or so warp threads per linear inch and sixty or more filling threads per inch, using No. 28 to 30 firmly twisted warp thread stock for both the warp and filling threads. In this way a fabric of plain weave may be produced which is at least twice as strong transversely as the ordinary commercial cloth so as to be correspondingly more valuable for use in gummed tape where the transverse strength is of preëminent importance. The principal function of the longitudinal threads in the cloth backing of the gummed tape is to hold the strips together while the gummed tape is being applied to the article or seam, for instance, and for this

purpose the strength of the warp threads is ample and still lighter and softer warp threads may be advantageously used and may preferably be woven with less tension than that given to the filling threads, so that the filling threads are relatively straighter in the finished cloth and the softer warp threads have a more zigzag or irregular arrangement between them; and this may advantageously cheapen the material so long as the weaving and other processes are not interfered with. Such specially woven cloth must of course be carefully handled during the subsequent processes of producing the gummed tape therefrom or at least until sufficient sizing or other material has been incorporated in the fabric to make the relative location and arrangement of the threads permanent so that they will not be subject to serious disarrangement. A glue or hygroscopic gum coating, that is a coating which readily absorbs water or moistening liquid in becoming soft and adhesive, may in some cases be directly applied to one or both faces of this specially woven cloth backing, or for more general sealing purposes the specially woven cloth may with advantage be carefully filled and finished in suitable ways so as to secure the desired degree of imperviousness before the water soluble glue or other adhesive coating is applied thereto and the web of gummed fabric slit or severed into strips of gummed tape of the desired width which can be wound up into the long rolls usually employed in moistening and sealing machines which are usually arranged for rolls having lengths of 300 or 500 yards, or in the case of the much smaller machines of 150 yards or so.

As shown in Fig. 1 of the drawing the web of gummed cloth may have the transversely arranged filling threads 2 of greater count or strength than the warp threads and the slitting rolls 3 having slitting knives 4 on them may continuously slit or sever the web into strips of gummed tape which may be wound into rolls, such as 6, of the desired size. Fig. 2 diagrammatically illustrates the arrangement which the threads may have in such strips of cloth gummed tape suitable for ordinary package sealing, etc. The filling or woof threads 2 are shown as having relatively great size compared to the warp threads 7 which may be of softer and weaker material so that they may lie in a relatively zigzag or irregular position with respect to the filling threads, as is governed by the relative tension on the threads during the weaving and other processes of manufacture, although it is of course understood that these differences are somewhat exaggerated in this diagrammatic illustration. The fabric may of course be dyed, filled and finished in such way as to render it substantially impervious and filling material 8 is diagrammatically shown on both sides of the threads so as to render the cloth substantially impervious even before the adhesive coating 5 is applied thereto. It is of course understood, however, that it is neither necessary to have any such complete filling of the cloth nor, indeed, any substantial filling thereof before applying the gummed coating in producing gummed cloth tape which can be used for some purposes.

This invention has been described in connection with a number of illustrative embodiments, forms, arrangements, numbers of parts and elements, materials, constructions and orders of steps and applications or methods of use, to the details of which disclosure the invention is not of course to be limited, since what is claimed as new and what is desired to be secured by Letters Patent is set forth in the appended claims.

1. The roll of adhesive cloth gummed tape consisting of a substantially continuous backing fabric strip having relatively straight threads extending transversely across it and connected by interwoven weaker longitudinal threads, there being about twice as many transverse threads to the inch as the interwoven threads to increase the transverse strength of the strip, filling material incorporated with said threads to render the ungummed side of the strip substantially impervious and a hygroscopic glue coating applied to one side of said strip to render the same adhesive when moistened.
2. The roll of adhesive cloth gummed tape comprising a substantially continuous backing fabric strip having threads extending transversely across it and connected by interwoven threads, there being about twice as many transverse threads to the inch as the interwoven threads to increase the transverse strength of the strip, filling material incorporated with said threads to render the ungummed side of the strip substantially impervious and an adhesive coating applied to one side of said strip to render the same adhesive when moistened.
3. The roll of adhesive cloth gummed tape comprising a substantially continuous backing fabric strip, there being about twice as many transverse threads to the inch as the interwoven threads to increase the transverse strength of the strip, filling material incorporated with said threads and an adhesive coating applied to one side of said strip to render the same adhesive.
4. The roll of adhesive cloth gummed tape comprising a substantially continuous backing fabric strip, there being about twice as many transverse threads to the inch as the interwoven threads to increase the transverse strength of the strip, and an adhesive coating applied to said strip to render the same adhesive.

5. The roll of cloth gummed tape comprising a filled woven cloth backing strip in which the transversely extending threads are considerably more numerous than the interwoven threads and have at least twice as great aggregate strength per linear inch and an adhesive coating applied to one side of said strip to render the same adhesive.

6. The roll of cloth gummed tape comprising a woven cloth backing strip in which the transversely extending threads are more numerous than the interwoven threads and have at least twice as great aggregate strength per linear inch and an adhesive coating applied to said strip to render the same adhesive.

7. The roll of cloth gummed tape comprising a woven cloth backing strip in which the transversely extending threads have at least twice as great aggregate strength per linear inch as the interwoven threads and an adhesive coating applied to said strip to render the same adhesive.

8. The roll of cloth gummed tape comprising a woven cloth backing strip in which the transversely extending threads are more numerous than the interwoven threads and have considerably more aggregate strength per linear inch and an adhesive hygroscopic gum coating applied to said strip to render the same adhesive.

9. The roll of adhesive cloth tape comprising a woven cloth backing strip in which the transversely extending threads have considerably more aggregate strength per linear inch than the interwoven threads and an adhesive coating applied to said strip to render the same adhesive.

10. The strip of adhesive cloth gummed tape comprising a woven backing fabric having relatively straight threads extending perpendicularly across the strip and connected by interwoven weaker and softer longitudinal threads, there being considerably more of the transverse threads to the inch than of the interwoven threads to increase the transverse strength of the strip, filling material incorporated with said threads to render the ungummed side of the strips substantially impervious and a hygroscopic glue coating applied to one side of said strip to render the same adhesive when moistened.

11. The strip of adhesive cloth gummed tape comprising a woven backing fabric having threads extending perpendicularly across the strip and connected by interwoven longitudinal threads, there being considerably more of the transverse threads to the inch than of the interwoven threads to increase the transverse strength of the strip and a hygroscopic glue coating applied to said strip to render the same adhesive when moistened.

12. The strip of adhesive cloth gummed

tape comprising a filled woven cloth backing in which the transversely extending threads have considerably greater aggregate strength per linear inch and an adhesive coating applied to one side of said strip to render the same adhesive.

13. The strip of adhesive cloth gummed tape comprising a filled woven cloth backing in which the transversely extending threads are more numerous and have considerably greater aggregate strength per linear inch than the interwoven threads and an adhesive coating applied to one side of said strip to render the same adhesive.

14. The long strip of adhesive cloth tape comprising a woven cloth backing strip in which the transversely extending threads have greater aggregate strength per linear inch than the interwoven threads to give the strip increased transverse strength and an adhesive coating applied to said strip to render the same adhesive.

15. The process of making strips of narrow cloth gummed tape which comprises weaving a web of backing fabric having relatively stronger and more numerous filling threads woven at considerably greater tension than the cooperating warp threads so that the filling threads are arranged relatively straighter in the fabric, finishing the fabric to render it substantially impervious, applying an adhesive gum coating to said fabric and slitting the web of gummed fabric into long strips so that the filling threads extend substantially perpendicularly to said strips.

16. The process of making strips of narrow cloth gummed tape which comprises weaving a web of backing fabric having relatively stronger and more numerous filling threads than the cooperating warp threads, finishing the fabric, applying an adhesive gum coating to said fabric and slitting the web of gummed fabric into long strips so that the filling threads extend transversely of said strips to increase their transverse strength.

17. The process of making strips of narrow cloth gummed tape which comprises weaving a web of backing fabric having considerably more numerous filling threads than the cooperating warp threads, applying an adhesive coating to said fabric and slitting the web of gummed fabric into long strips so that the filling threads extend transversely of said strips to increase their transverse strength.

18. The process of making rolls of cloth gummed tape which comprises weaving a backing fabric having filling threads that are considerably stronger per linear inch than the interwoven warp threads, finishing the fabric and rendering it substantially impervious, applying an adhesive hygroscopic gum coating thereto, severing relatively narrow

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row strips from said gummed cloth so that the filling threads extend transversely of said strips to increase their transverse strength and winding said strips into rolls.

- 5 19. The process of making strips of cloth gummed tape which comprises weaving a backing fabric having filling threads that are considerably stronger per linear inch than the interwoven warp threads, applying an adhesive coating thereto and severing relatively narrow strips from said coated cloth so that the filling threads extend transversely of said strips to increase their transverse strength.
- 10 20. The process of making cloth gummed tape strips which comprises weaving a backing fabric having filling threads that are considerably stronger per linear inch than the interwoven warp threads, filling and finishing the fabric, applying an adhesive gum coating to one side of said fabric and severing relatively narrow strips from said gummed cloth so that the filling threads extend transversely of said strips to increase their transverse strength. 20

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Witnesses:

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