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(54) Zipper

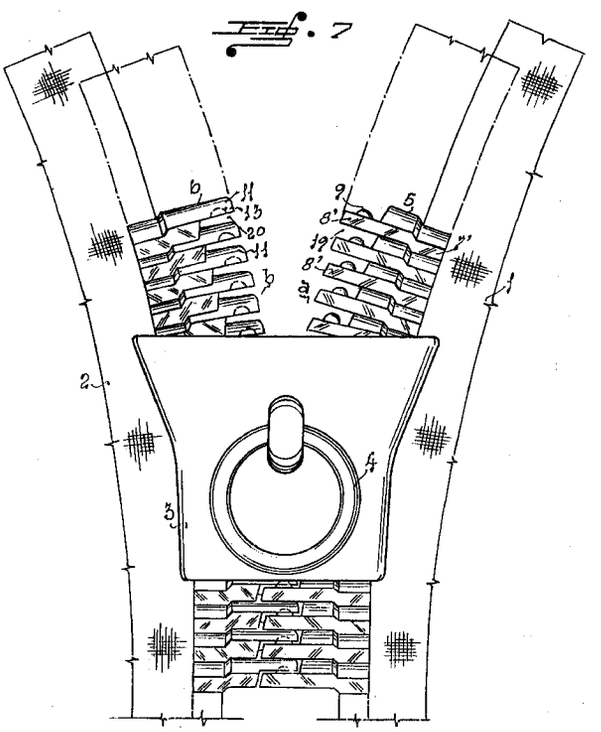
(57) This invention provides a mechanism which enables the zipper's opening and closing, even if some of the teeth crack.

The rows of teeth, a and b, are adapted to be fixed to the items through tapes 1 and 2, either by sewing or any other means. Both rows are interlocked by the conventional slide (3) which has a ring (4).

The male teeth in row a (5) have their correspondent female teeth in row b (6) at the same height and not in Y shape. The male teeth (5) have a stub (9) in their overlapping ends, while the female teeth (6) have an alveolar cavity (13) in their overlapping ends for the insertion of the said stub.

Stretch 7' of teeth 5 is composed of an area for fixing the teeth on tape 1 and stretch 8' has a stub (9) through which it fastens to teeth 6.

Between the contiguous stretches (8') of teeth 5 and the adjacent stretches (11) of teeth 6 that project themselves from the edges of tapes 1 and 2, the respective spaces (19 and 20) are formed for the intercalation of stretches 8' in space 20 and stretch 11 in space 19. This occurs during the opening and closing of the zipper by means of the slide (3).



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Description

Technical Field of the Invention

The present invention relates to the general art of closures, and to the particular field of the zippers.

Background of the Invention

Many different items are closed by zippers. A diving suit is one common example of an item which needs to be closed with a zipper in order to ensure a comfortable fit, a practical manner to put it on or take it off, to avoid the entrance of water, or the like. Other examples of garments in which a zipper is placed include trousers, raincoats, skirts and boots. Obviously these embrace only a few options since they can be extremely diverse.

Tents also have zippers placed on them to ensure their opening and closing, to protect the things inside from rain, dirt or the likes. Other examples include wallets, purses, suitcases and any sort of bags.

Although the conventional zipper solves many problems of closures, it has several drawbacks which inhibit the full commercial succes thereof.

The main problem that the conventional zipper presents is that since its teeth are placed in a Y shape, if there is a "chain crack", the zipper is of no use anymore. Therefore, the garments, bags or any other item can not be used unless the zipper is replaced. This is of extreme importance . For example, the cracking of the zipper in a luggage durind a trip, or of a tent, while the user is outdoors, means running into many problems and risks.

Unlike the conventional zipper in which the teeth of each row are in quincunxes, that is, that every tooth of one row is interposed between two teeth of the other row, in the G.E.A. ZIPPER, the toooth of each row is at the same height with regard to the correspondent tooth of the other one and both are related to each other by the overlapping of their ends.

Therefore, there is a need for a zipper which allows not only the effective closure of an item, but also its efficient functioning even if some of its teeth crack.

Objects of the Invention

It is a main object of the present invention to provide a zipper which can be used in the most diverse items to permit a secure closure.

It is another object of the present invention to provide a zipper which does not need to be replaced, even if some of its teeth crack, because it is designed in a way to allow the most efficient functioning.

It is another object of the present invention to provide a zipper which not only does not need to be replaced if some of its teeth break, but furthermore, there is no twisting of the zipper if this happens, because the teeth keep linking as if the remaining teeth were put in the same level of the missing ones.

It is another object of the present invention to provide a zipper which does not produce the effect of twisting even if some of its teeth crack because they keep linking as if the remaining teeth were placed in the place of the missing ones.

It is another object of the present invention to provide a zipper in which each pair of teeth are fastened by part of a tooth from the pair that is inmediately above.

It is another object of the present invention to eliminate the problems produced by the "chain crack" of the conventional zipper.

Brief Description of the Drawing Figures

Figure 1: It is a side elevation in a longitudinal cut of a tooth correspondent to one of the rows.

Figure 2: It is a side elevation in a longitudinal cut of a tooth correspondent to the other row.

Figure 3: It is a transversal cut in accordance with diagram A-A of the tooth in Figure 2.

Figure 4: It is a transversal cut in accordance with diagram B-B of the tooth in Figure 1.

Figure 5: It is a side elevation in a longitudinal cut showing graphically how a tooth from one row is connected to a tooth in the other row.

Figure 6: It is a front view showing the set of teeth of Figure 5.

Figure 7: It is a front view of the elevation displaying fragmentally the G.E.A. zipper.

Detailed Description of the Invention.

From the diagrams, and speciallly on account of Figure 7, we can contemplate the rows of teeth, a and b, (Fig. 7), adapted to be fixed to items, through tapes 1 and 2, by sewing or any other means. Both rows of teeth are interlocked by the conventional slide (Fig. 7).

Throughout this mechanism, the opening and closing or vice-versa of the zipper take place and the slide operates with ring 4 (Fig. 7) articulated to its external face.

Teeth 5 (Fig. 2, 3, 5, 6 and 7.) and teeth 6 (Fig.1, 4, 5, 6 and 7) which form part of rows a and b (Fig. 7), have the following characteristics:

On one of their faces, teeth 5 have two coaxil grooves, N° 7 and 8 (Fig. 2, 3 and 5) which delimit means in their length, stretch 7' and 8' (Fig. 2 and 5). Stretch 7' (Fig. 2, 5 and 7) is composed of an area for fixing the teeth on tape 1 (Fig. 7) and stretch 8' (Fig. 2, 5 and 7) has a stub, N° 9, (Fig. 2, 3, 5, 6 and 7) through which it fastens to teeth 6. The said stub has a hemispherical structure.

Teeth 6 (Fig. 1, 4, 5, 6 and 7) present a stretch, N° 10 (Fig. 6) fixed to tape 2, and a coaxial stretch, N° 11 (Fig. 1, 5, 6 and 7) provided with a groove, N° 12 (Fig. 1, 4 and 5) with an alveolar cavity, N° 13 (Fig. 1, 4, 5, 6 and 7) in its bottom surface for insertion of stub, N° 9 (Fig. 7). This produces the linking of the teeth of both rows.

The teeth component of the two rows are adapted to adjust to the mutual contact of their juxtaposed surfaces. Their surfaces are of transversal semi-circular section, convex in teeth 5, N° 14 (Fig. 2 and 5) and concave in teeth 6, N° 15 (Fig. 1 and 5) forming in this way, surfaces of reciprocal contact between male teeth, N° 5 (Fig. 7) and female teeth, N° 6 (Fig. 7), with an articular movement normal to the symetric axis of tapes 1 and 2 (Fig. 7).

Stretch 7' of teeth 5 (Fig. 2, 3, 5 and 7) and stretch 10 of teeth 6 (Fig. 1, 4, 5 and 6) have their respective longitudinal neckline, N° 16 for teeth 5 (Fig. 2, 5 and 6) and N° 17 for teeth 6 (Fig. 1, 5 and 6), constituant of an area for the insertion and subsequent fixing of the teeth through pressure adjustment in tapes 1 and 2.

Between contiguous stretches 8' (Fig. 2, 5 and 7) of the teeth in row a (Fig. 7), and the adjacent stretches 11 (Fig. 1, 5, 6 and 7) of the teeth in row b (Fig. 7) that project themselves from the edges of tapes 1 and 2 (Fig. 7), the respective spaces, N° 19 and 20 (Fig. 7) are formed for the intercalation of stretch 8' (Fig. 7) in space 20 (Fig. 7) and of stretch 11 (Fig. 7) in space 19 (Fig. 7) during the closing and opening of the zipper through slide 3 (Fig. 7). This establishes the reciprocal lock between those stretches by placing stub 9 (Fig. 7) in the alveolar cavity 13 (Fig. 7).

For further security in the fixing of the teeth to the tapes, these should preferably have a trimming similar to a cord on the sides where the teeth must be inserted.

Claims

1. A zipper comprising:

   A) Two rows of metal teeth mounted on stringer tapes along inner longitudinal edges, thereof, a slide threaded on said pair of rows of teeth for movement to close and open the zipper.
   B) teeth from one row of the tape are different from the ones on the other row of the tape . One row has male teeth and the other female teeth. The row of male teeth from one tape have a linking stub in their respective overlapping ends, while the row of female teeth in the other tape have the corresponding alveolar cavity in the teeth's overlapping ends for the insertion of said stub.
   C) teeth components of the two rows are adapted to adjust to the mutual contact of their yuxtaposed surfaces. The said surfaces are of transversal semi-circular sections, convex in the row of teeth from one tape and concave in the row of teeth of the other tape , forming surfaces of reciprocal contact between respective male and female teeth.
   D) a trimming similar to a cord on the sides of the tapes where the teeth are fixed, thereof, it ensures a further security of the zipper.

2. A zipper according to claim 1, wherein said zipper has a contiguous stretch of the row of male teeth in one tape and an adjacent stretch of the row of female teeth in the other tape, that project themselves from the edges of the tapes forming spaces for the intercalation of the stretches on said rows.

3. A zipper according to claim 1, wherein said zipper is locked between said stretches in claim 2 with slide by placing the stub of the male teeth of one tape in the alveolar cavity of the female teeth in the other tape which are at the same height and not in Y shape

4. A zipper according to claim 1 to 3, wherein, the two rows of teeth from the different tapes have no other bond than that established by the linking of their "heads" providing thereof, an interlocking system which enables the articulation between said teeth by forming angles, without affecting the gear between them.

5. A zipper according to claim 1 to 4 wherein both teeth rows of said zipper have longitudinal projecting means on the top part and in relation to these, the pair of teeth inmediately on top, have longitudinal groove means of enclosing on the botton for those projections, thereof, one tooth from each pain of teeth of both rows, embraces in length, not only the tooth that is inmediately below, but also part of the tooth to which this is linked.

6. A zipper according to claim 1 to 5 constituent of an area for the insertion and subsequent fixing of the teeth through pressure adjustment in respective tapes 1 and 2 designed to allow an effective closure and an efficient functioning.

Fig. 4

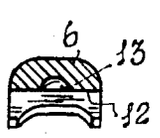


Fig. 1

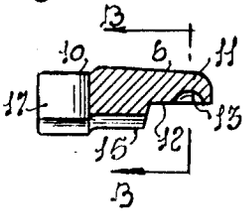


Fig. 2

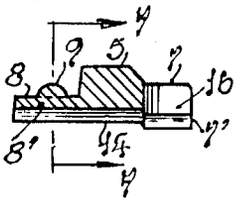


Fig. 3

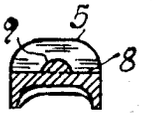


Fig. 5

Fig. 6

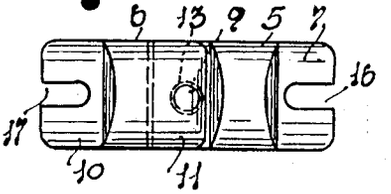
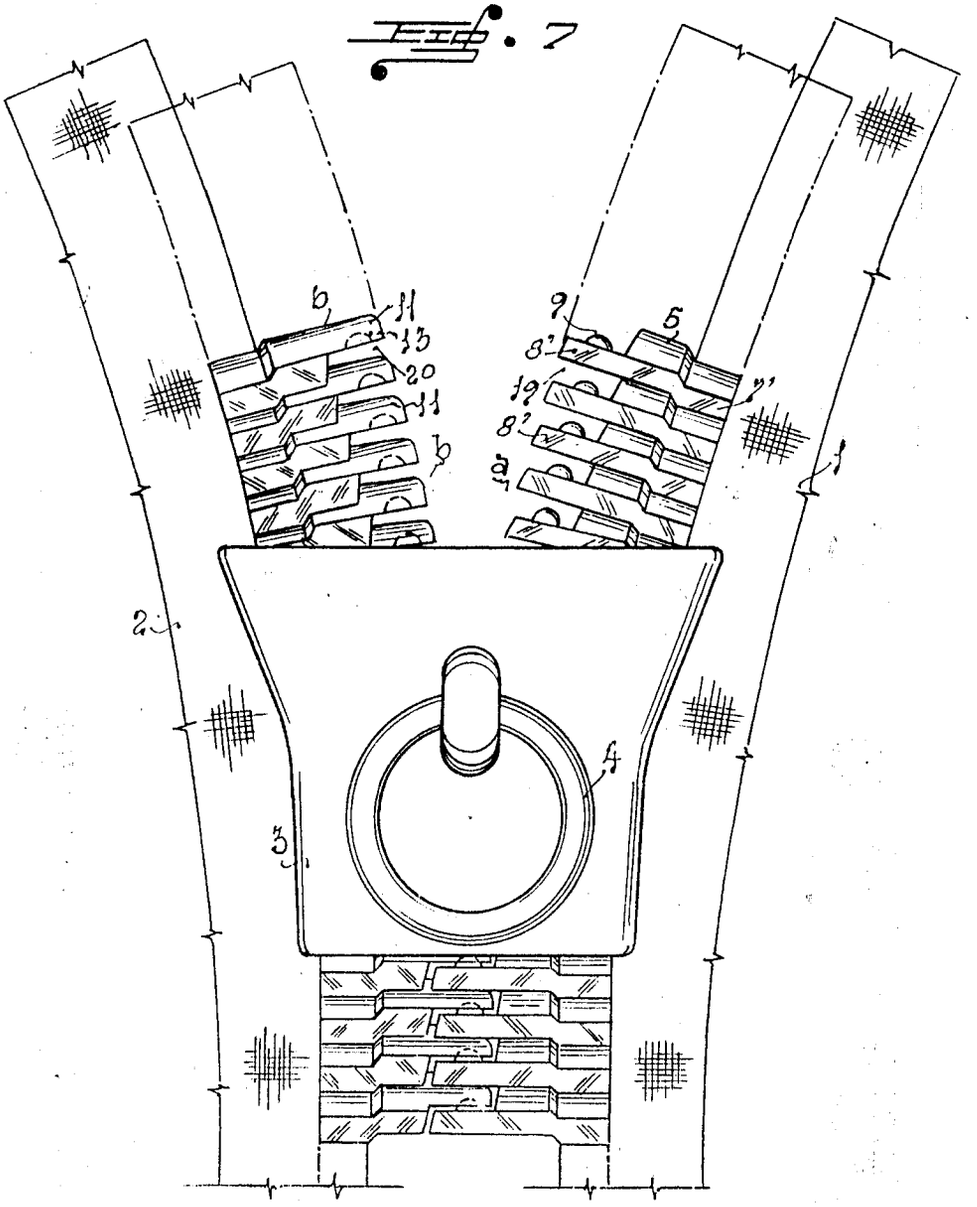


Fig. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 96 20 2070

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US-A-1 836 958 (D. F. DALTON) * page 1, line 21 - page 2, line 64; figures 1-6 *	1,3	A44B19/06
A	US-A-1 745 116 (W. L. PIPES) * page 1, line 84 - page 3, line 2; figures 1-7 *	1	
A	US-A-1 741 789 (W. D. PEIFFER) * page 2, line 32 - line 73; figures 5-15 *	1	
A	GB-A-522 167 (M. STEIN) * page 1, line 76 - line 98; figures 1,2 *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A44B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 November 1996	Garnier, F

CATEGORY OF CITED DOCUMENTS

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