No. 808,713. PATENTED JAN. 2, 1906.

R. APPLEYARD.

BALL.

APPLICATION FILED JUNE 20, 1904.

FIG. 7.

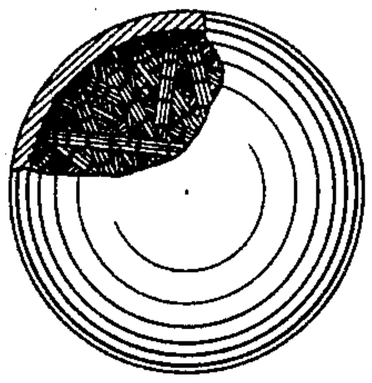


FIG. 1.

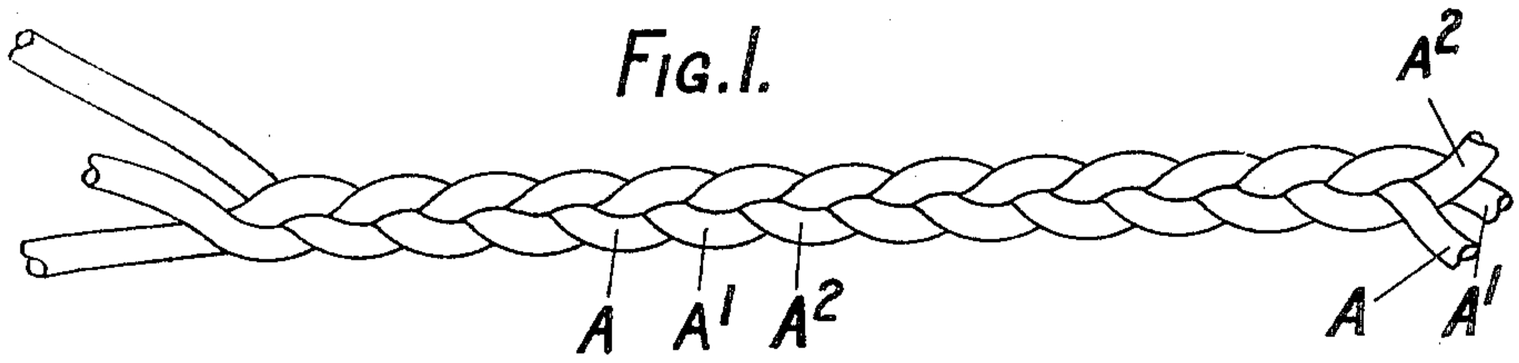


FIG. 2.

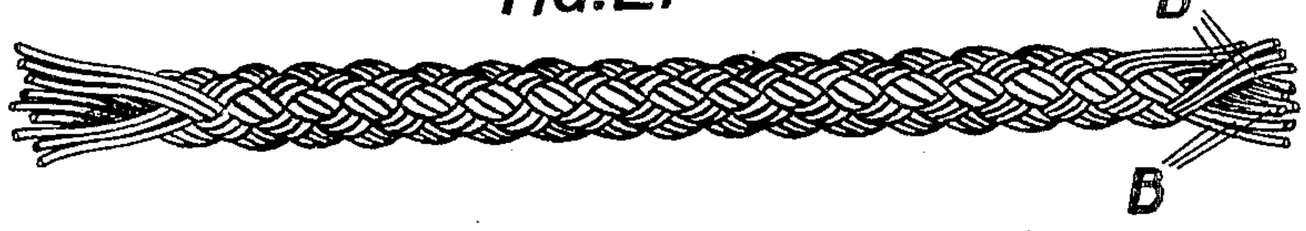


FIG. 3.

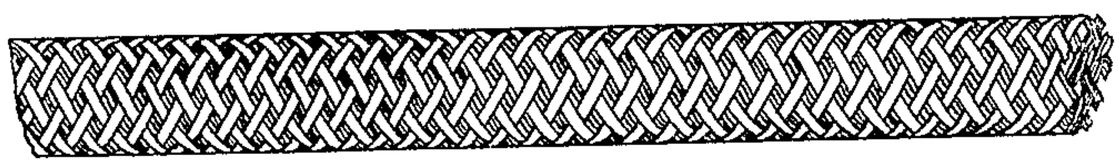


FIG. 4.

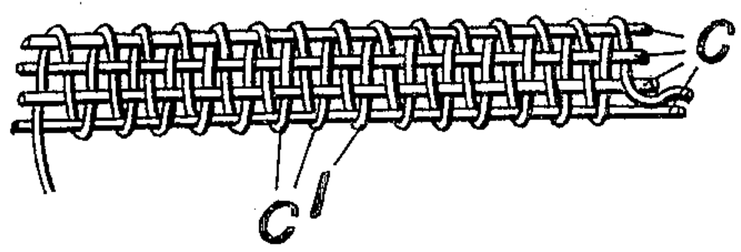


FIG. 5.

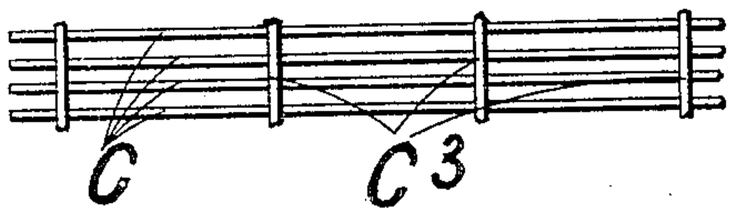
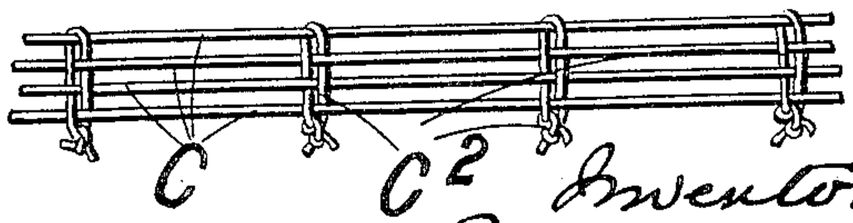


FIG. 6.



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UNITED STATES PATENT OFFICE.

ROLLO APPLEYARD, OF SILVERTOWN, ENGLAND.

BALL.

No. 808,713. Specification of Letters Patent. Patented Jan. 2, 1906.

Application filed June 20, 1904. Serial No. 213,289.

To all whom it may concern:

Be it known that I, ROLLO APPLEYARD, a subject of the King of Great Britain, and a resident of Silvertown, Essex, England, have invented certain new and useful Improvements in Balls, of which the following is a specification.

Elastic balls, such as golf-balls, have heretofore been formed by winding a single elastic thread or filament under tension upon a core until the required thickness of rubber has by this means been built up. This process has been improved upon by winding two or more filaments simultaneously upon the core, and in some cases the filaments have been twisted together for the purpose of multiplying the interstices between them to increase the resiliency of the completed ball. These methods of building up a ball of an elastic winding are, however, unsatisfactory, as machinery cannot be efficiently employed for the purpose, as where one filament or several filaments twisted together or otherwise are wound simultaneously the machinery must be stopped if a filament breaks, and this frequently occurs. Moreover, where one filament only is wound at a time a given body of rubber must necessarily be built up much more slowly than where three or more filaments can be applied simultaneously. According to this invention these difficulties are overcome, the ball being formed of a winding of elastic cord composed of three or more threads or strands interlaced in such a manner that should one break it is carried forward by the others, so that the process of winding need not be stopped, said cord being formed entirely of caoutchouc.

In the accompanying drawings, Figure 1 shows a cord built up according to one method of carrying out this invention, and Figs. 2, 3, 4, 5, and 6 show modified methods of building the cord. Fig. 7 is a view of the completed ball, part of the cover being cut away.

The elastic cord of which the ball is built up is composed of three or more threads or strands, such as A A′ A^2, Fig. 1. In this figure the three strands are shown on an enlarged scale interlaced or plaited together in a well-known manner.

In Fig. 2 another form of interlacing or braiding is shown, in which more than three strands are employed. Each strand in this figure is composed of several substrands, those of one strand being indicated at B and those of another at B′. The braiding shown is of a known type, and therefore does not require description, and obviously may be carried out with unit strands instead of multiple strands—that is, connections of substrands, as shown.

Another form of interlacing is shown in Fig. 3. This is a known form of tubular braiding, (shown on a large scale,) the white spaces indicating the lacing on the near side and the shaded spaces the lacing seen on the inner side of the further wall of the tube.

A further form of interlacing is shown in Fig. 4, in which a flat band or tape is formed by weaving. The longitudinal or warp threads are shown at C, and a weft-thread C′ is interlaced across them.

In Figs. 5 and 6 two modifications of the construction of cords shown in Fig. 4 are illustrated.

In Fig. 6 the weft-thread C′ is replaced by cross-connecting tie or gripping pieces. (Shown in this figure as separate threads C^2.) These threads are woven round the longitudinal threads and the ends secured in any convenient manner, such as by tying together. This construction is again further modified in the form of cord shown in Fig. 5, the cross-connecting threads C^3 in this case being laid flat upon the longitudinal threads, to which they may be secured by any suitable means.

It will be understood that all of these cords are shown on a magnified scale for the sake of clearness.

The main advantages of interlacing the strands to form a cord in this manner may be enumerated as follows: first, a saving of time in that the golf-ball can be wound by machinery, which is impossible with a single strand or two strands twisted together, as such cords cannot be kept in position during winding; second, that should one strand or filament break while winding under tension the process of winding need not be stopped, as this filament expands immediately when fractured owing to the strain being taken from it, so that it is caught by the other filaments and carried on; third, by winding three or more filaments simultaneously the ball may be made up to the required dimensions much more quickly than where only one or two strands can be wound simultaneously; fourth, a cord of flattened cross-section can easily be produced by interlacing according to any of the methods described, so that the various windings are readily retained in place upon each other or upon the central core.

It will be seen that where two or more strands twisted together are employed if one breaks it mmediately flies loose, so that winding must be stopped until the broken strand is again taken up, whereas when the strands are interlaced the tension under which the cord is wound is immediately removed from any strand that breaks, so that this expands to its normal cross-section and is caught by the other strands, as already described. Again, a cord formed of twisted strands being circular in form is very difficult to retain in position while winding.

It will be understood that this invention is not restricted to the particular forms of interlacing or cross-connecting described, these only being given by way of example.

The tubular cord shown in Fig. 3 will obviously flatten during winding, so that this construction is a mechanical equivalent of a cord of flattened cross-section composed of interlaced strands.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A new article of manufacture consisting of a ball, the wound portion of which is formed of a winding of elastic cord composed of three or more longitudinal threads or strands cross-connected, all parts of the cord being composed entirely of caoutchouc, substantially as set forth.

2. A new article of manufacture consisting of a ball, the wound portion of which is formed of a winding of elastic cord of flattened cross-section composed of three or more longitudinal threads or strands cross-connected, all parts of the cord being composed entirely of caoutchouc, substantially as set forth.

3. A new article of manufacture consisting of a ball, the wound portion of which is formed of a winding of elastic cord composed of three or more threads or strands plaited together, the whole being formed of caoutchouc, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROLLO APPLEYARD.

Witnesses:
WM. HAYWARD,
C. MCKENZIE.