

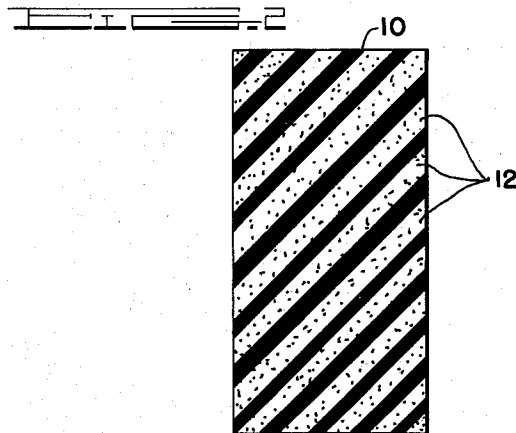
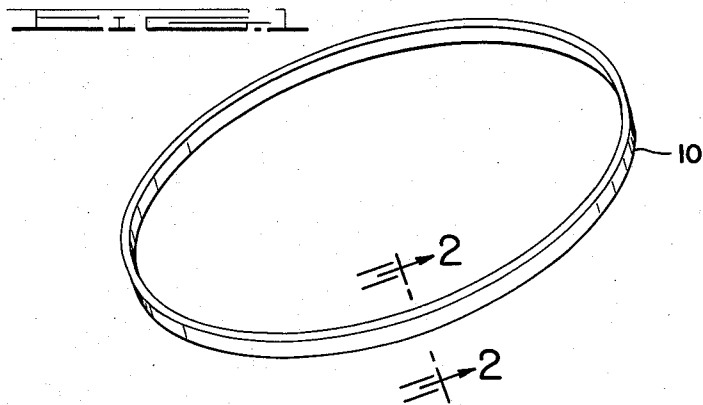
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MAGNETIC RUBBER TOBACCO PRIMING BANDS

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1

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MAGNETIC RUBBER TOBACCO PRIMING BANDS

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1 Claim. (Cl. 24-16)

This invention relates to rubber bands, but more particularly rubber bands the presence of which in a non-metallic mass is detectable by a metal detecting apparatus.

While not limited to such use, this invention finds its most practical application in the tobacco industry where, as tobacco leaves are being primed, rubber bands are used to group the leaves together for curing. These bands must, of course, be removed prior to the processing of tobacco leaves into a smoking mixture as, if not removed, the odoriferous result when the tobacco is burned would certainly detract from the smoker's pleasure.

It is therefore mandatory that a very thorough and time-consuming inspection be made by hand and eye prior to the processing of the tobacco to determine the presence of and remove any bands which may have been inadvertently left on the leaves or which may have been accidentally dropped into the leaves.

The invention herein described enables the inspection for the presence of rubber tobacco priming bands to be conducted by an automatic process used to detect foreign metallic particles which might have become lodged in the tobacco. In the past such an inspection for metallic substance has been conducted separately from the inspection to determine the presence of the rubber priming bands. The combining of the inspection for the rubber bands with the inspection for metallic particles will, of course, substantially reduce the overall cost of inspection in addition to reducing the time involved.

The object of this invention therefore is to provide a rubber band which may be used in grouping leaves of tobacco together for curing, the unwanted presence of which may be detected in a mass of unprocessed tobacco by means of a device which indicates the presence of metal in a non-metallic mass.

Further objects and advantages of the present invention will become apparent from the description and claim and the accompanying drawing in which:

FIGURE 1 is a perspective view of a rubber band embodying the present invention; and

FIGURE 2 is an enlarged cross-sectional view taken on the line 2-2 of FIGURE 1.

The improved rubber band 10 herein described is composed of a synthetic or natural rubber compound to which has been added a quantity of minute magnetizable particles 12. As will be explained, the minute magnetized particles are magnetic oxide of iron (Fe_3O_4). The impregnation of the rubber band with a quantity of magnetized particles enables the presence of the band within a mass of tobacco to be detected by means of a variety of currently available and well-known devices for the detection of metal in a non-metallic mass.

The particles are added to the rubber mixture prior to the vulcanization thereof by the use of a rubber mill or other suitable process. During the manufacture of rubber bands, the rubber is formed into a tube having the desired diameter of the end product. The tube is then transversely sliced into rubber bands of the width desired. For reasons of economy of manufacture, the bands must, of course, be impregnated with a detectable substance before the final slicing of the tube.

The impregnation of a rubber compound with particles of metal in order to provide rubber which has certain desired characteristics of a metal has been proposed

2

heretofore. However, in accordance with this invention, it has been found that the impregnation of metallic particles into rubber for the manufacture of rubber bands is entirely unsatisfactory for two reasons: first, the presence of metallic particles in the rubber causes the service life of the knife blades used to slice the rubber into bands to be reduced to the point where the cost of manufacture of the bands is prohibitive. Also, the ever-present sharp edges on the metallic particles reduce the service life of the rubber band due to fracturing of the rubber when the band is repeatedly stretched. On the other hand, it has been discovered that the use of the oxides of a metal to impregnate a rubber compound for use in the manufacture of rubber bands will not to any substantial extent curtail the service life of the cutting knives, nor will the use of metallic oxides reduce the service life of the band itself, as will the metal particles. It has also been discovered that the impregnation of rubber with sufficient quantities of magnetic oxide of iron (Fe_3O_4) will permit the manufacture of a rubber band having the characteristic of being detectable by a metal detecting device. Thus it has been found that the use of magnetic oxide of iron to impregnate rubber from which a rubber band is to be manufactured permits the manufacture of a rubber band having the desired advantages of a metal-impregnated band without any of the disadvantages.

Further, in accordance with this invention, it has been found that the quantity of magnetic oxide of iron introduced into the rubber compound is critical. In order for the oxide-impregnated band to be detected within a mass of tobacco leaves by means of current metal detection devices, the oxide must be present within the band in a certain minimum quantity. To this end no less than 20% of ferro-ferric oxide (Fe_3O_4) by weight of rubber should be introduced into the rubber. If the quantity of ferro-ferric oxide introduced is below this limit, the necessary 100% detection of the rubber bands cannot be assured. It has also been found that, if the proportion of oxide introduced into the rubber exceeds a certain percentage by weight of the rubber, the tensile strength of the rubber will be reduced to the point where the rubber will not be suitable for use as a rubber band. The rubber would of course be suitable for use for a variety of other purposes; however, the resiliency of the rubber would not be of a high enough value to permit use as a rubber band. To this latter end it has been found that a limit of 40% of ferro-ferric oxide by weight of rubber should not be exceeded in the manufacture of a magnetic rubber band.

A rubber band constructed as described may be very easily manually placed about a plurality of stems of tobacco so as to retain them in a group for curing. Following curing of the leaves, the bands may be quickly removed by hand without fear of damage to the tobacco whereupon the leaves are ready for slicing or other subsequent operation. During the removal of the bands from the stems, it is possible that one or more bands may fall in among the leaves unnoticed by the worker. The presence of such inadvertently remaining bands may easily be detected by passing the tobacco leaves on a conveyor belt or the like travelling past an electro-magnetic metal detector of any suitable type which will automatically indicate either visibly or audibly the presence of metal in a non-metallic mass, whereupon the band may be manually removed.

Thus, it can be seen that there has been contributed to the tobacco industry a novel and extremely useful means by which the inspection of tobacco for the presence of rubber priming bands is greatly improved and

whereby the cost of this inspection is almost entirely eliminated.

I claim:

A rubber band for grouping tobacco leaves for curing having the characteristic of being detectable in a non-metallic mass by means of a metal detecting device, comprising an endless rubber band formed of rubber, through-out which has been dispersed a quantity of ferro-ferric oxide, said ferro-ferric oxide being present in said band in a quantity of not less than 20% nor more than 40% of the weight of rubber.

5

10

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