

Fig. 1.

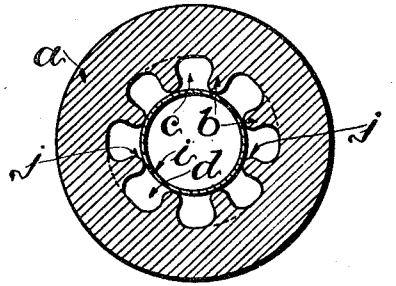


Fig. 2.

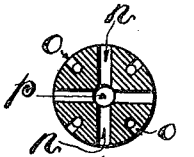
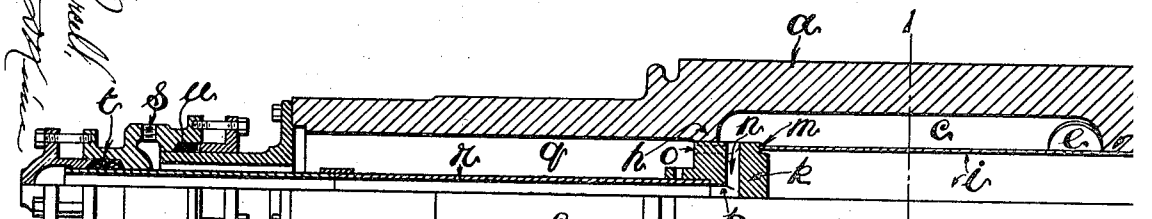


Fig. 3.

Witnesses:
Chatten Sewall
H. Penniman

Inventor:
James L. Ruttall
by Munn & Co
Attorneys



UNITED STATES PATENT OFFICE.

JAMES HENRY NUTTALL, OF MANCHESTER, ENGLAND.

ROLLER APPARATUS FOR MASTICATING PLASTIC AND LIKE MATERIALS AND FOR OTHER PURPOSES.

1,149,853. Specification of Letters Patent. Patented Aug. 10, 1915.

Application filed June 5, 1914. Serial No. 843,221.

To all whom it may concern:

Be it known that I, JAMES HENRY NUTTALL, subject of the King of Great Britain and Ireland, and resident of Heaton Chapel, Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Roller Apparatus for Masticating Plastic and like Materials and for other Purposes, of which the following is a specification.

My invention relates to improvements in masticating and like machinery for treating plastic materials such as india rubber and other substances which require grinding or reducing from a comparatively coarse to a fine texture. In this class of machinery a considerable amount of friction is set up by the action of the rollers on the material and as a result considerable heat is generated. It is desirable to reduce the temperature of the rollers as low as possible and to keep them at a low temperature, various means having been employed for the purpose. Such means are not, however, sufficiently effective for the purpose and my object is to provide improved means whereby a much lower temperature of the rollers can be attained.

My invention consists essentially in providing the interior of each roller with a number of pairs of longitudinal chambers through which a cooling medium may be circulated from a source common to all the pairs.

The invention will be fully described with reference to the accompanying drawing in which—

Figure 1 is an elevation and part longitudinal section of a roller constructed in accordance with my invention, Fig. 2 transverse section of same on line 1—2 of Fig. 1 and Fig. 3 transverse section of a part of the roller hereinafter referred to.

With the aforesaid object in view my invention consists in chambering out the main portion *a* of each roller and providing it with a number of longitudinal ribs *b* standing out radially so as to form a number of longitudinal grooves or smaller chambers *c* and *d* which are arranged in pairs. Each of these pairs of chambers communicates by means of a transverse or circumferential passage *e* at one end. At the inside ends of the trunnion portions *f* of the roller I provide inwardly-projecting flanges or facings *g* and *h* one at the inner end of each trunnion portion. These flanges, or one of them *g*, are suitably machined to receive a metal pipe or tube *i* which is driven in so as to make a liquid-tight fit between its exterior and the flange faces. This tube forms a closure portion for the inner edges *j* of the longitudinal ribs *b* so closing the pockets at their inner sides. The arrangement I prefer however, is to make the tube a tight fit against the face *g* at one end by expanding the tube from the inside and at the other to employ a head or boss *k*, the outer face of which fits tightly against the face *h*. This head is reduced in diameter at one end to form a shouldered projection *m* to receive the other end of the tube *i*. The head *k* is provided with radial passages *n* and *o* arranged alternately, the former communicating at one end with a hole *p* common to all of them, and at the other ends with chambers *c* while the alternate holes *o* communicate at their inner ends with chambers *d* and at their outer ends with the annular space *q* surrounding a supply tube *r* for the cooling medium. Such tube *r* is expanded into the hole *p* of the head *k* or is secured to the latter in any other convenient way. Cold water or other suitable cooling medium is conveyed by the tube *r* to the pairs of chambers *c* and *d* so that a plurality of cooling effects is obtained around the whole circumference of the roller, the water passing along the tube through chambers *c* and then returning by way of chambers *d* and holes *o* to the annular space *q* from whence it is discharged by a pipe connection at *s*. By this means the whole surface of the roller is kept in a cool condition most effectively. A further feature of the construction is that it allows of the circumferential shell of the roller being made much thinner than is usually the case as the longitudinal ribs act as beams serving to strengthen the shell. The usual form of stuffing box or stuffing boxes *t* and *u* may be employed in connection with the improved cooling arrangements.

My invention may also be applied to calender and like rollers in which it is sometimes desirable not only to keep them cool

but sometimes to keep them heated, the arrangement hereinbefore described admitting of both these effects being obtained.

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

The combination, with a hollow roller having hollow trunnions at its ends, said roller being provided with longitudinal grooves arranged in pairs, each pair being connected at one end, said roller having also internal facings beyond and adjacent to the ends of the grooves, of a head secured in the facing at the disconnected ends of the grooves, said head having inlet and outlet passages for the said grooves and having also a shouldered projection, a pipe secured on the said projection and in the facing inside the roller at the other ends of its grooves and forming a cover for the said grooves, a tube arranged in one of the trunnions and forming with it an annular chamber, said tube and chamber communicating with the separate passages in the head, and pipe connections for the said tube and chamber secured to the said trunnion.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

JAMES HENRY NUTTALL.

Witnesses:
D. M. Davies,
O. de Weir.