ROLLER CONES

E. L. Keegel

One of the major problems in rolling is to get the maximum amount of dhool in the minimum time without sacrificing appearance and liquoring properties. Although it is very easy to get excessive dhool outturn it is by no means a simple matter to get the correct type of tea.

Scientific evidence has shown that most of the action in rolling takes place at the centre of the roller table. So it follows that the larger the central fitting the higher will be the dhool outturn, but there is obviously a limit to the extent to which the former can be increased in size. If the limit is exceeded, the fitting will not only reduce the potential capacity of the roller by occupying an unnecessarily large volume but also impose an unusually heavy strain on the door mechanism. These difficulties could be partly overcome by having fittings which are merely vertical projections or so shaped that their tops are partly vertical. Even then they would not be entirely satisfactory since the lateral pressure induced would cause the formation of choppy dhool. With a normal-sized fitting, dhool outturn can be forced by the application of heavy pressure but this is also undesirable since "throw-out" will be excessive and circulation of the leaf restricted, which will in turn result in undue development of heat. This naturally must be avoided if quality is not to be lost.

To obtain the maximum efficiency in rolling, therefore, the main requirements are:

1. maintenance of circulation of the leaf under pressure,
2. prevention of crushing of leaf against the jacket,
3. expression of juice by a wringing action and not spoiling appearance,
4. adequate production of dhool,

and 5. minimum amount of "throw-out."

It has now been recognized that the central fittings in use today do not satisfy all these requirements. Either they produce too much of dhool with little twisting action or fail to give the required amount of dhool even under heavy pressure. The necessity for an improved type of central fitting that would prove satisfactory for the whole operation of rolling was therefore evident.

Experiments carried out in the past have clearly demonstrated that the plain cone is the simplest fitting needed to improve efficiency in rolling. The 35° cone developed by the Institute has so far given good results but its use entails, in most cases, the employment of 5 rolls for reducing the bulk. If rolling could be carried out 4 times without adverse effect on the tea, it would mean that one roller less would be required. In present times with the lack of equipment to cope with extra crop a reduction in the number of rolls would certainly be an economic advantage

on most estates. It was mainly with this object in view that an improved type of central fitting was sought which, besides increasing economy, would give the maximum possible efficiency.

In the plain 35° cone the base has to be as large as possible to exercise any effect on circulation. The clearance between the edge of the cone and the jacket at its nearest approach is so small that the only possible method of modification to improve efficiency is to increase the slope of the cone. In doing so, not only does the cone become too bulky but it also exerts a considerable effect on the leaf between the jacket and itself. It would therefore appear that the solution to the problem is to have a cone with the maximum slope permissible which would not smash the leaf and which would, at the same time, be sufficiently large to promote circulation.

The most critical factor in rolling is the distance between the jacket and the centre of the table at their nearest approach. Hence any central device to satisfy the requirements of efficient rolling should bear some relationship to this critical distance, which varies according to the crank throw of the roller and diameter of jacket. This has led to the development of a cone with an angle of 45° at its base and of varying diameter which is now referred to as the Keegel cone to distinguish it from other cones in use. The dimensions of the cone recommended for rollers of different sizes are given in the following table:—

Table 1. *The Keegel cone. Dimensions of 45° cones recommended for full range of rollers in general use.*

Roller	Cone	
	Base	Height
28" C.C.C.	4"	2"
28" Walkers	5½"	2¾"
32" ,,	6½"	3¼"
34" C.C.C.	7"	3½"
34" Davidsons	8"	4"
35" Walkers	8"	4"
36" Marshalls (and square Jacksons)	9"	4½"
40" C.C.C.	10"	5"
40" Walkers	10½"	5¼"
44" C.C.C. and Davidsons	12"	6"
45" Walkers	13"	6½"
45.5" C.C.C.	12"	6"
46.5" Walkers	11½"	5¾"
46.6" Davidsons	13"	6½"
47" C.C.C.	12½"	6¼"

No claim is made that the installation of a Keegel cone would solve all rolling problems, but where results have not been satisfactory due to wrong types and sizes of central fittings some improvement in the teas can be expected by its use. It will for some time to come at least end the confusion which still exists in the choice of cones.

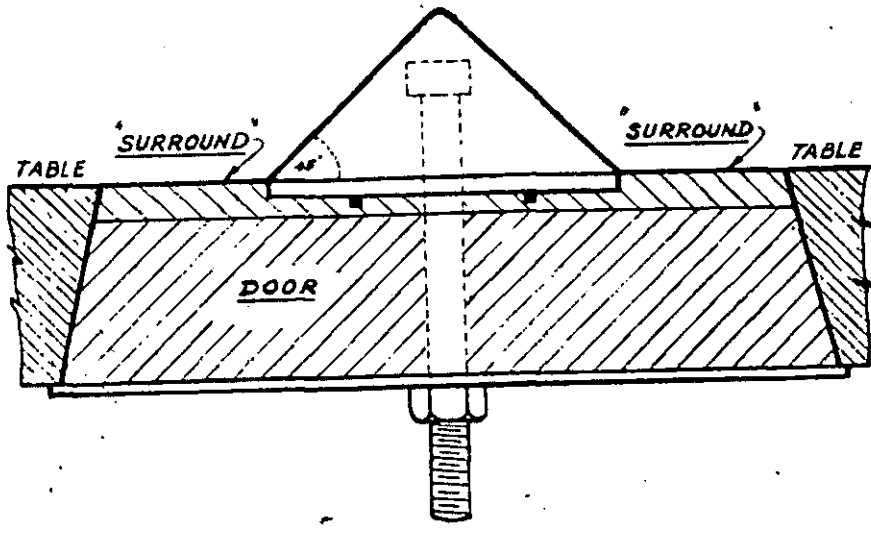
The Keegel cone is recommended for any type of rolling provided pressure is adjusted according to individual requirements. It can be used in conjunction with any type of batten on the market, but in the case of the "M & S" battens certain precautions have to be taken. An annular ring between the edge of the base and the edge of the door should be provided to conform to the shape of the battens

which extend to the edge of the door. The Colombo Commercial Company have now a standard drawing of the manner in which the cone could be adapted to "M & S" battens. In the case of tables having shorter battens such as the "Crescent," all that is required is a flat 'surround,' level with the table.

It is strongly recommended that the cone be installed by an engineering firm, but if it is to be made by a local carpenter the following points should be observed:—

1. The sides of the cone should be straight.
2. The angle at the base of the cone should be exactly 45°.
3. The base should be flush with the table. There should be no projecting edges.
4. The apex of the cone should be slightly rounded off.
5. Pegs should be provided at the base of the cone to prevent it from turning. In the alternative a bolt may be used. (Left-hand thread on bolt for clockwise motion of jacket; right-hand thread for an anti-clockwise motion). The bolt should be at least 1" in diameter and have a square head.

The accompanying diagram shows the shape of the Keegel cone and the manner in which it should be fixed to the door if it is not cast in brass but made of wood.



— THE KEEGEL CONE —

Drawn by K. Sothisrihari