The next development in the weaving industry to follow on shuttleless weaving may be in multi-phase weaving where more than one shuttle or weft carrier inserts weft into the warp simultaneously. The circular loom has been in use for some years weaving certain types of fabrics in the form of hoses. Conventional flat fabrics can also be woven on circular looms. This paper is a report of the work done on a circular loom to investigate the possibility of attaining higher weft densities and to find the length of weave repeat for certain types of fabric.

From the above observations, it will be clear that in approaching the problem of circular looms, one has to distinguish between those aspects of circular looms which are special to them and those which share with flat multi-phase looms and where they can therefore be regarded as being representative of this type of loom whether flat or circular.

For the experimental work reported here, no flat multi-phase loom was available and it was decided, therefore, to work on a circular loom which was installed in the UMIST laboratories and which was designed primarily for the weaving of jute bags. One important feature which is common to circular and many flat multi-phase looms is the method of beat-up which is very different from the beat-up in conventional looms and which is a potential source of difference with regard to the cloth constructions that can be woven. It was therefore decided to conduct parallel experiments on a conventional (single-phase) loom for the purpose of making comparisons. These comparisons were concerned primarily with the maximum cloth density that could be achieved at the same time. Multi-phase looms have been shown at various machinery exhibitions for some time but so far they have found only very limited application in industry. Therefore, very little practical experience exists with regard to the economic and technical feasibility of the kind of loom. What tends to be frequently overlooked, however, is that a certain type of multi-phase loom, i.e. the circular loom has been in use for a number of years. The available circular looms are therefore mature machines and with the growing interest in multi-phase weaving generally, it seems reasonable to turn attention to the circular looms with a view to finding out that they can teach us about multi-phase weaving in general and about circular weaving in particular. With this in mind, some research has recently been undertaken at the University of Manchester, Institute of Science and Technology (UMIST) and some of the results of this work are presented here.

In present-day industrial practice, fabrics produced on circular looms are almost invariably woven in the form of hoses for applications where this shape is actually required such as fire-hoses (hoses for fire brigades), bags, etc. It is useful to remind ourselves, however, that this need not necessarily be the case. Conventional flat fabrics can be woven on circular looms and this possibility received serious attention by weavers and loom makers some twenty to thirty years ago. It is to some extent related to the possibility of automating circular weaving and is also briefly discussed near the end of this paper.

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