Fig. 8 Inked roller at left not in contact with roller at right.
Fig. 9 Rollers shown in fig. 8 making contact with each other. The ink film on the roller at the left in fig. 8 is halved. Even distribution of ink over the two rollers.

Fig. 10 Splitting of ink film by 3 rollers

ing and loss of brilliancy. Fig. 5 and 6 show arrangements liable to loss of tone under conditions of great plate length in the peripheral direction with limited length of the printing areas.
Another point to be mentioned is that the motion of the vibrators in the inking unit and the reversal of direction result in some discontinuity of the ink flow. This condition will become more pronounced if the degree of emulsification is not what it should be. In other words the effect of the oscillating motion which is normally almost imperceptible makes itself felt when the water and ink balance is disturbed because of unfavourable disposition of the subject matter on the plate.

I. What can the printer do to prevent or reduce loss of tone?

The answer is:

a) Use ink as viscous as possible, i. e. as tacky as the surface of the paper will permit. This will diminish water absorption in the inking unit.
b) Use water with a pH index corresponding to maximum interfacial tension. The interfacial tension between water and ink is a measure of the water-repellent properties of the ink. If the pH index exceeds 7.5, the affinity of water and ink increases, meaning that the ink will more readily accept water. There is a definite relationship between pH index and interfacial tension. A pH index of 5 to 6 is normally considered to be particularly favourable, but other factors, too, must be taken into account. One of them is the water retaining ability of the plate.
c) Add alcohol to the damping water. Addition of alcohol makes it possible to cut the "water budget" of the plate and thereby to reduce emulging to a minimum. Alcohol can be used in any conventional inking unit.
d) Placing a packing under the blanket in the region of the sheet tail is often used as an expedient. This adds body to the impression, but actually is only a light enlargement of the screen dots. While some sort of optical balance is thus established, half tones and three quarter tones are naturally impaired. There is indeed some improvement, but the method is not a remedy.

II. What can the designer of printing presses do to counter loss of tone?

1. Provide an alcohol damping unit. In M.A.N. machines this can be done by adding specific items to the conventional damping unit as shown in fig. 7. The M.A.N. alcohol damping unit is a simple modification of the conventional gear, not programme-controlled or automated, uncomplicated and easy to instal in existing machines without much expenditure of time and money.
2. Equip the machine with a 360° resetting device. This device is based upon the following theory: – when two cylinders roll upon each other, one inked and the other not, both will take and yield ink. The ink film thickness is approximately halved, in other words there is splitting of the film and

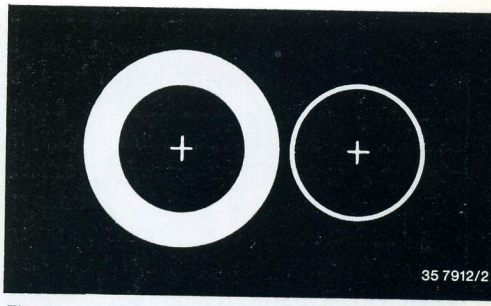

Fig. 8

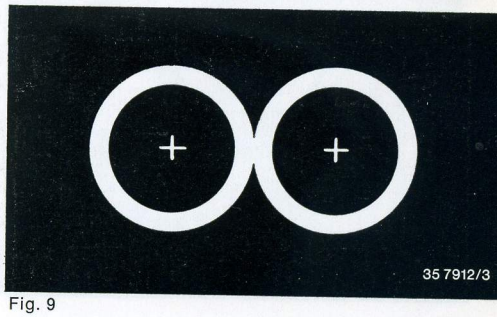

Fig. 9

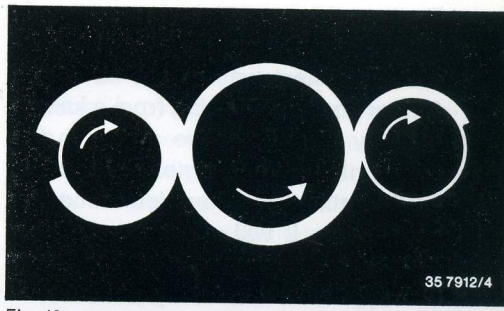

Fig. 10