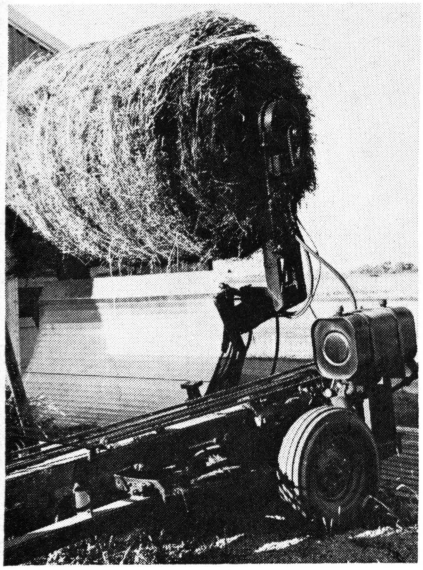

Fig. 1 Above, the baler with a partially completed bale. At left, the spindle-arm ejects a bale

To Form A BIGGER BALE

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A progress report on the development of a single-machine giant bale handling system . . .

OUR goal in this project is a completely mechanized hay handling system in which one machine can build and transport a giant package that needs little or no protection from the weather. This would be accomplished by a machine that could form bales up to 6 ft in diameter and 7½ ft long by picking up a windrow of hay and wrapping it on powered spindles. Bale density would be controlled by the pressure and resulting friction between the bale and bale chamber. Bales could be unloaded when completed, then reloaded later by lifting them with the spindle-arm combination. They could then be transported to the storage area. Perhaps to feed the bales, they could even be rotated in reverse in the Bale chamber and the hay stripped from the bales with a feeder attachment.

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Fig. 2 After the moving floor was added the hay bulged at the point of recompression when expansion and recompression occurred along different lines

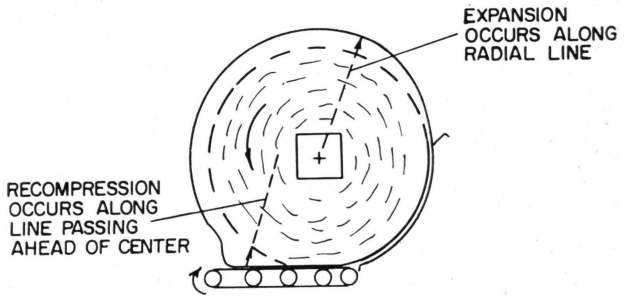
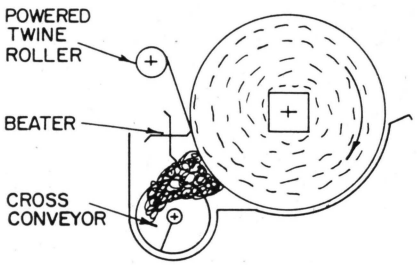


Fig. 3 Below, a proposed feeder attachment



After various field tests, the machine in Fig. 1 has evolved. While the spindles with long hinged teeth successfully guided the windrowed hay into the machine in early tests, the hay tended to accumulate in front of the bale rather than rotating with it. Adding a moving floor and a sheet metal shroud relieved that problem of hay accumulation but after the bale was about 3½ ft in diameter it tended to bulge at that same spot (Fig. 2).

In the final tests that season twine fed from a hydraulic dispenser was repeatedly wrapped around the bale as it was being formed. Even though short grassy hay was used, the twine held the bale together during forming and handling. In these tests four bales averaging 665 lb each were formed. Average diameter was 4.67 ft; average length was 7.167 ft. Bale volume varied from 107 to 149 cu. ft. Low bale density remains an unsolved problem.

Fig. 3 is a sketch of a proposed feeder attachment. The baler has the ability to support the bale and rotate it in reverse, indicating the practicality of this technique as part of a feeder system.

Hopefully such a hay-handling system could be made available at a price competitive with other systems. Initial cost for this system is estimated at $8000 and operating costs per ton at $2.47. These costs for the conventional bale system are averaged at $7400 and $3.40; for a haylage system, $13,400 and $4.11; for a loose hay system, $2300 and $1.93.

Thus this system offers the possibility of completely eliminating hand labor by substituting a reasonable investment in equipment and twine for the cost of labor. ● ●