

Migration Of Fish Over Weirs With The Help Of A System With Toothed Wheels And A Movable Rubber Surface

fish passage engineer - PhD - Răzvan Voicu

In the left or right bank that is concreted or we fix a concrete pillar, we fix a metallic bearing. On the inner circle of the bearing we fix a metal bar on which we fix a gear wheel (fig.1). Also on this bar we fix a wheel with wooden, metal or plastic paddles. (fig. 1).

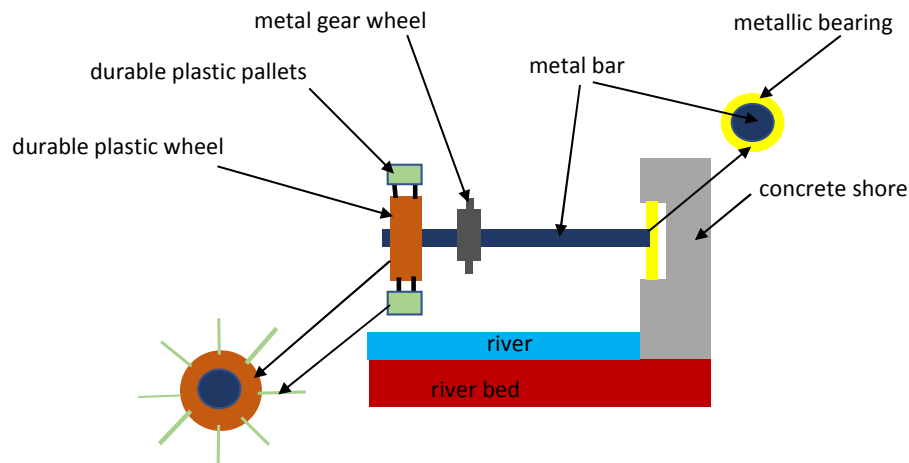


Figure 1 Paddle wheel positioning

The wheel with resistant plastic paddles is fed (it is set in motion) with water from a resistant plastic pipe in the shape of S. The upstream end of the pipe is fixed to the weir with the help of a metal semi-cylinder fixed in turn to the weir (fig.2). Water flowing through the pipe is captured upstream of the spillway so there is a continuous flow that moves the plastic vane wheel. In the upstream part, the pipe has a metal valve with the help of which it closes. Two metal cylinders (cylinders with a thin middle) are built. One of these cylinders (the upstream one) has next to it a metal gear fixed on the metal shaft that supports the cylinder with the thin middle (fig. 3). The gear wheel of the cylinder with the thin middle is in the same plane as the gear wheel of the metallic shaft fixed in the bearing which is fixed in the concrete shore (fig.3). The transmission belt set in motion the system is built of a metal chain or resistant rubber. The metal bars on which the cylinders with a thin middle are fixed are fixed with the help of metal bearings in a rectangular metal frame (fig. 4). The metal frame is S-shaped (fig.5). The upper part of the bars on which the cylinders with a thin middle are fixed is fixed with the help of metal screws to the spillway threshold (fig.5). The lower part of the bars is fixed to a concrete plate fixed horizontally

in the river bed. There are cases when the lower part of the metallic frame rests on the river bed without the need for the concrete sheet pile. Rubber stoppers that are fixed to the movable rubber surface help to transport the fish over the spillway(fig.3). Through the movement of the rubber surface, all fish (migratory or not), including juveniles, can pass over the spillway threshold, which has not been achieved in any system so far. The system can be used at other weirs of the same size or after some modifications at other weirs of other sizes. In winter or when there are no more fish migrations, the system can be turned off with the help of the valve on the water supply pipe.

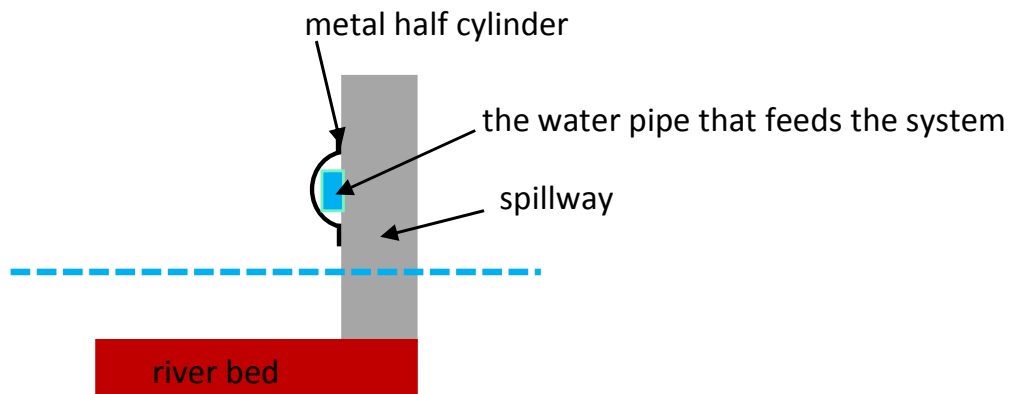


Figure 2 Positioning of the water pipe that sets the wheel with plastic paddles in motion

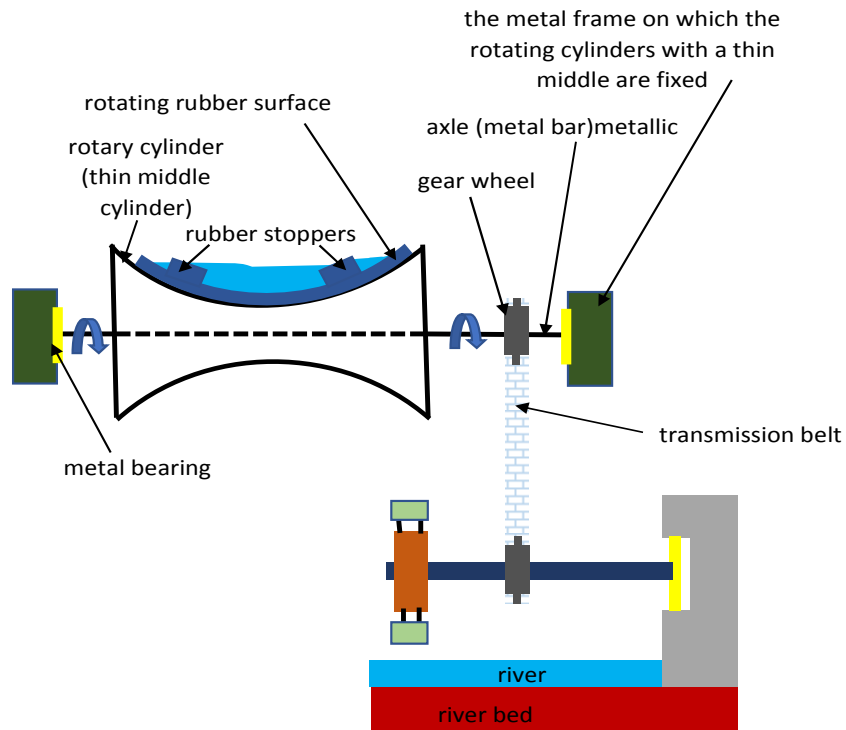


Figure 3 Positioning the drive belt on the two sprockets

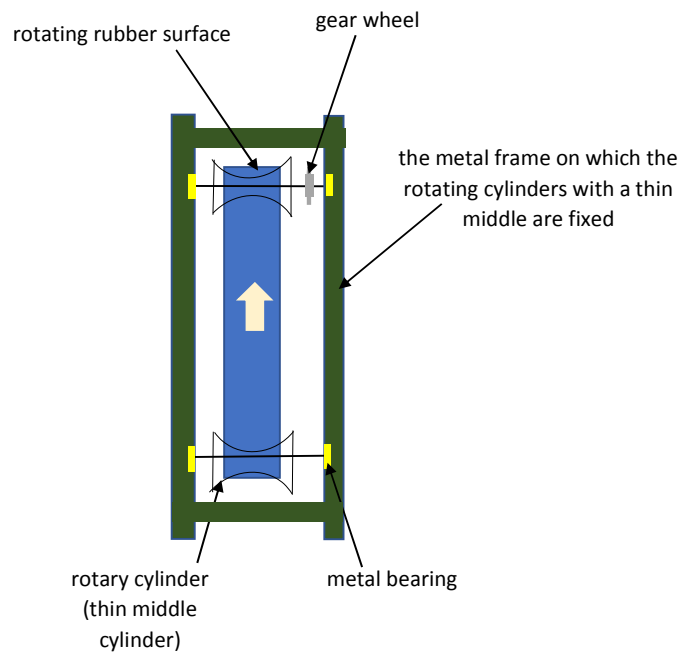


Figure 4 Positioning of thin middle cylinders inside the metal frame

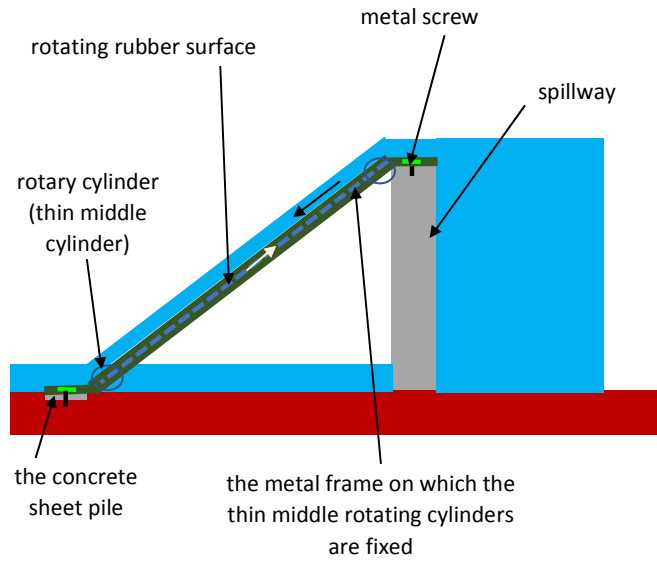


Figure 5 Fixing the metal frame