

Squeeze for Speed

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While watering our garden with water coming out of a flexible pipe we often press the end of the pipe to get a higher velocity of the water (see *Figure*). An application of Bernoulli's equation shows that in both cases a and b in *Figure*, the velocity of the water coming out of the pipe is

$$= \sqrt{2gH} ,$$

where H is the height of the water level in the tank above the pipe exit.

Then, how can we explain that a reduction of the exit area increases the velocity of the water coming out? Is there a difference in the two flow rates?

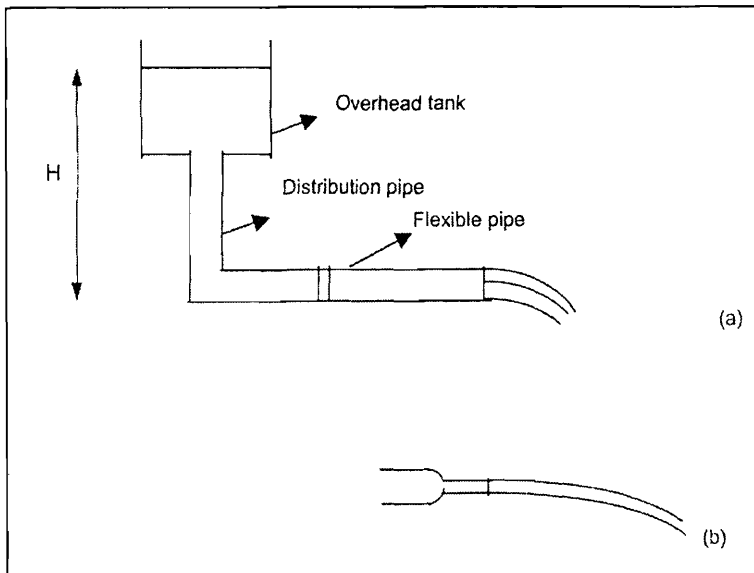


Figure. Schematic diagram showing the connection of a flexible pipe to an overhead tank.

(a) water coming out of an unsqueezed pipe.

(b) when the end is pressed, water coming out has a higher velocity.