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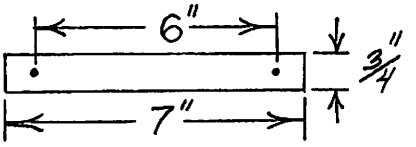
A wood model of a polaroid filter, to be used with the aluminum wire "waves".

(a) pieces: 4 pine sticks, ¼" thick

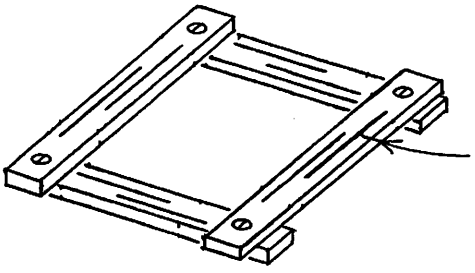
A 9/64" drill bit is recommended for the holes in the pine sticks.



4 #6-32 x 3/4" machine screws

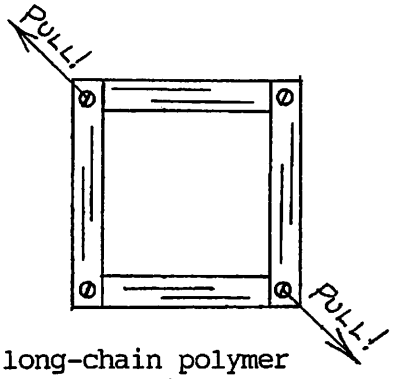
4 #6-32 stop (lock) nuts

(b) assembled:



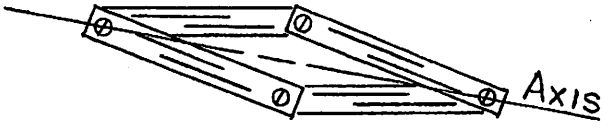
With a black felt tip pen and ruler, draw "long-chain polymers" on the wooden sticks.

(c) use: (1)



long-chain polymer molecules in the soft plastic before being stressed

(2)



long-chain polymer molecules in the filter after being stressed and solidifying

(d) A pair of these is needed for a better explanation; make two.

Explanation: Classroom polarizing (linear) filters are made of plastic, of long-chain polymer molecules. In the initial plastic sheet these molecules go in all directions, but if the soft sheet is stressed before it hardens (solidifies), the molecules will align themselves along one axis or plane as illustrated in the model above. When electromagnetic waves pass through (among) these aligned molecules, the waves whose oscillating electric fields are in the same direction as the molecules will start electrons oscillating (resonating) up and down the long chains at the same frequencies. Energy is transferred from the waves to the oscillating electrons or absorbed by the filter's molecules. The original waves in this particular direction are removed (filtered out) of the beam that passes on through. The remaining beam has been "polarized" or now has its electric field in a direction that is mainly 90° to that of the filter. A second filter whose plane is rotated 90° to the plane of the first will eliminate most of the remaining beam (its electric field).