Thru-reflector-kitchen wall solar nonimaging concentrating cooker study 2-22-2018
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A beginning of a thru-wall solar nonimaging cooker design is with the sizes of the selected cooker vessels and reflector top hinged door (Fig.1A, X and Y); followed by design of theinvolute reflectors which are shown in plan with flat glass mirror segments adhered to a masonry substrate (Fig. B). The reflector involutes can be stepped on with soft shoes by maintenance workers. The big east-west-line CPC trough has flat glass mirror segments adhered to masonry and/or ferrocement, and lift of reflector aluminum wood frame panels. The tracking east and west reflector wings are reflector aluminum on horizontal bamboo poles (Fig. 1G) supported on concrete ballasts.

The tracking wing E&W reflectors are protected by surrounding building walls from most of the horizontal wind loads, however because of other wind loads the west reflector wing can have an engineered spring, and the wings would be tied into secure stow position before forecasted wind storms. The thickness of the metal reflector facets (about 0.020”/0.5mm) bend with wind loads permitting wind passage, but are stiff enough to hold position when they are inclined without large wind loads. A study has reflector facets around 24x24”/610x610 (FxG) or less with 11 facets on 3 horizontal bamboo poles; WW= 7’-6”/2.28m and HW= 6’-4”/1.93m.

Thru-reflector-kitchen wall solar cooker with sloped hip roof building for around 12 deg latitude regions. The nonimaging CPC reflector concentrator solar cooker substrate-structure-foundation is also building-roof and wall structure-foundation for combined economic credit (Fig. 1F).

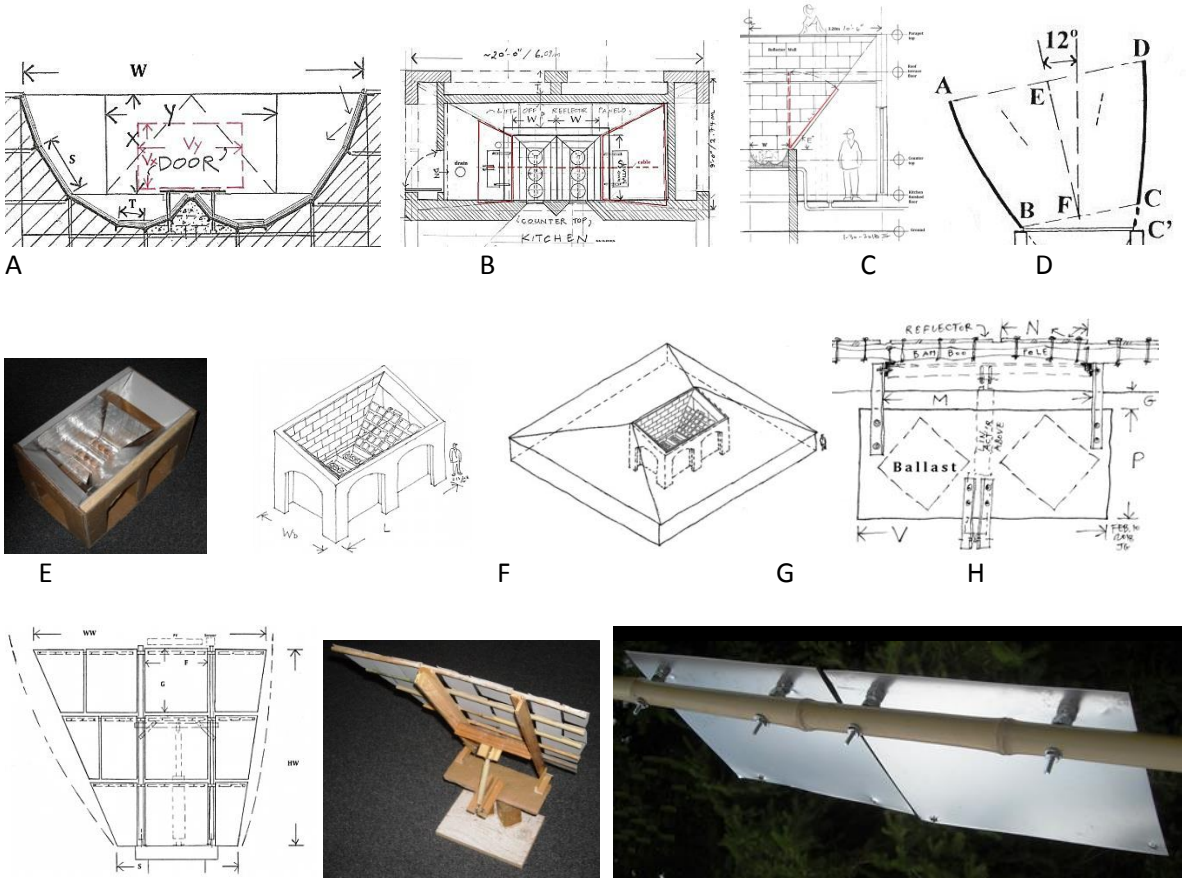

Fig. 1- Thru-reflector-kitchen wall solar nonimaging concentrating cooker