0.1 Box Stability

In which ways can a box be folded to obtain a stable structure; stable, implying that the box is self-supporting; here stability is dependent on the folds and the cuts of the folds. This question is raised to determine how to construct boxes without the aid of glue, staples, tape, or other adhesive aides.

Having little precedence in the research regime the following chapter seeks to answer the first (requisite folding pattern) of the two questions by introducing notation - speifically dot notation - to represent sections of a box diagram.

Conjecture 1: All box diagrams can be represented by a symmetrical structure.

0.1.1 Folding Notation

The box dot notation for box diagrams is desribed below:
$\circ$ - represents a peripheral flap
$\bullet$- represents the central walls
$\otimes$ - represents a webbed flap
$\circ^+$, $\bullet^+$ - represents a male connector
$\circ^-$, $\bullet^-$ - represents a female connector
x - represents the base of the structure
x_i - represents an aggregate base of the structure

Diagrammatic Explanation

Below are provided example of dot notation for a few popular bix folds. These folds an be found in the book *Package Folding* published by the Dutch publishers Agile Rabbit.

In some case a base will not be present, therefore an imaginary base, $\mathbf{x_i}$, must be constructed. The following examples show implementations employing imaginary bases.

In the case where a diagram is asymmetrical, symmetry can be obtained by means of transformation. Table 9 shows an asymmetrical diagram that has been transformed by a simple method of rotating the horizontally adjacent flap clockwise and continuing the process. .

From the above examples we develop the following onjecture.
Conjecture 1: All box diagrams can be represented by a symmetrical structure.

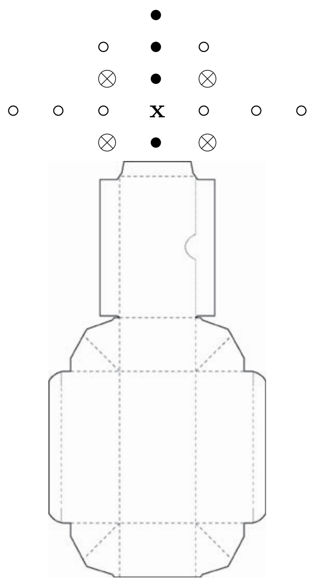

Table 1: Page 196. Reclosable Top

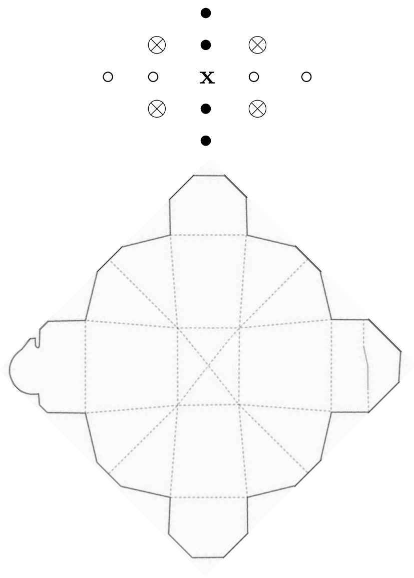

Table 2: Page 288. Chinese Take-out

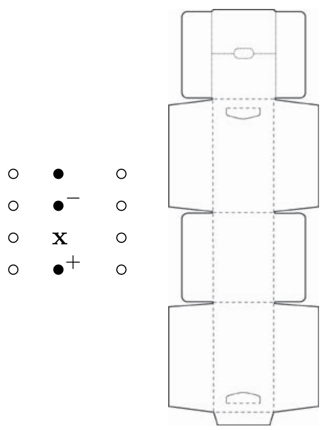

Table 3: Page 202.

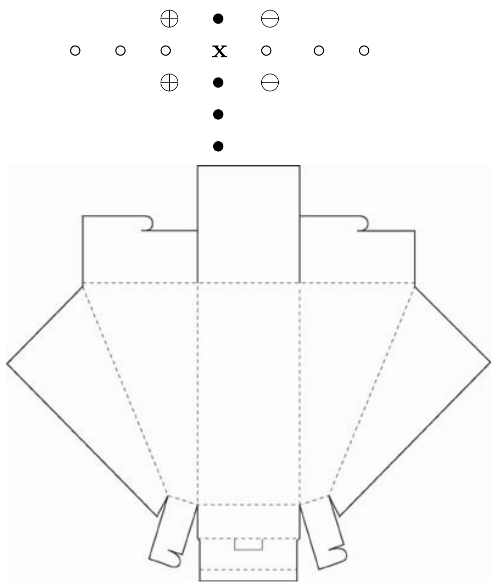

Table 4: Page 150. Display Box

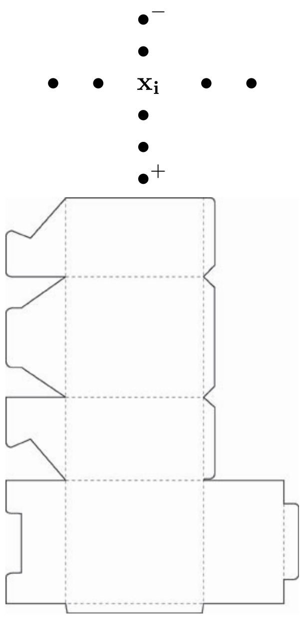

Table 5: Page 84.

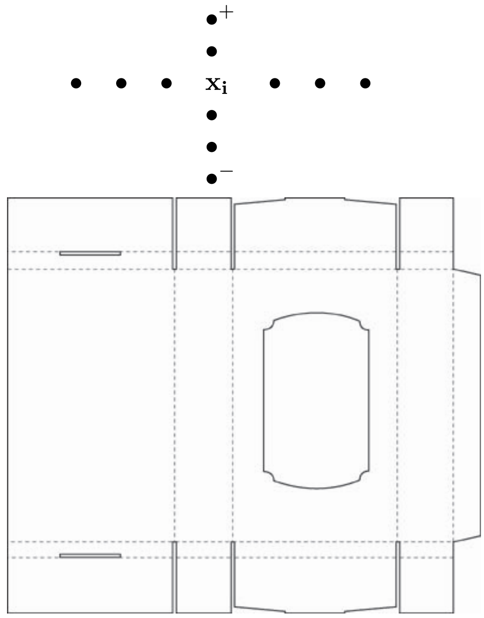

Table 6: Page 130.

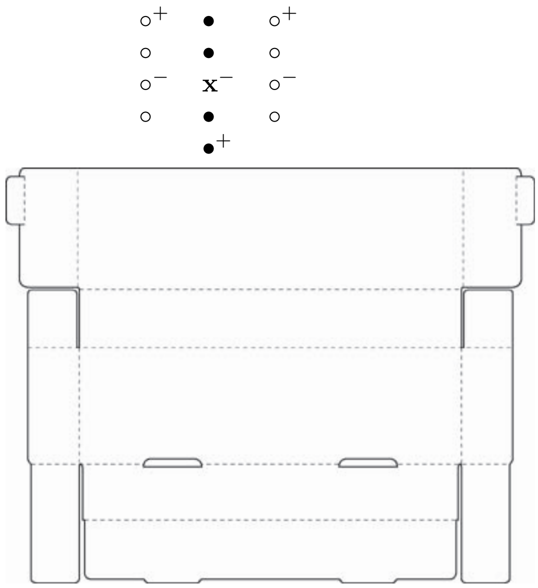

Table 7: Page 82.

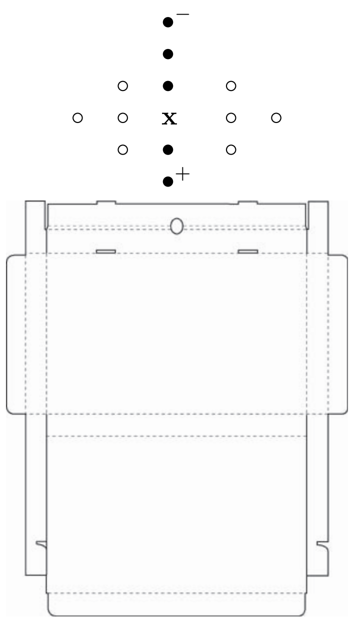

Table 8: Page 90.

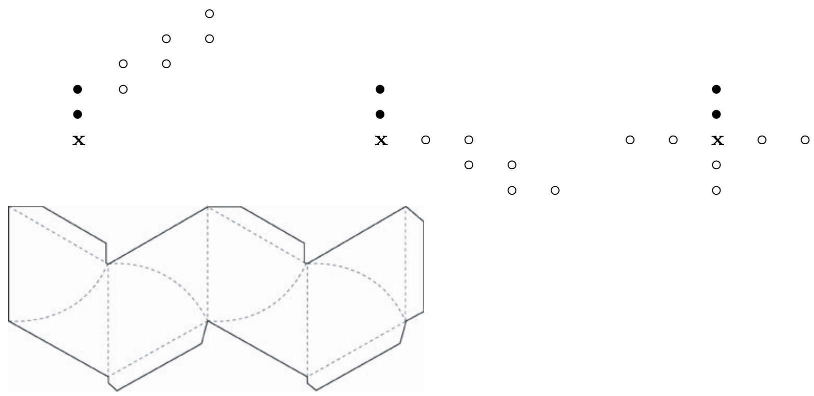

Table 9: Page 418. Transformation