

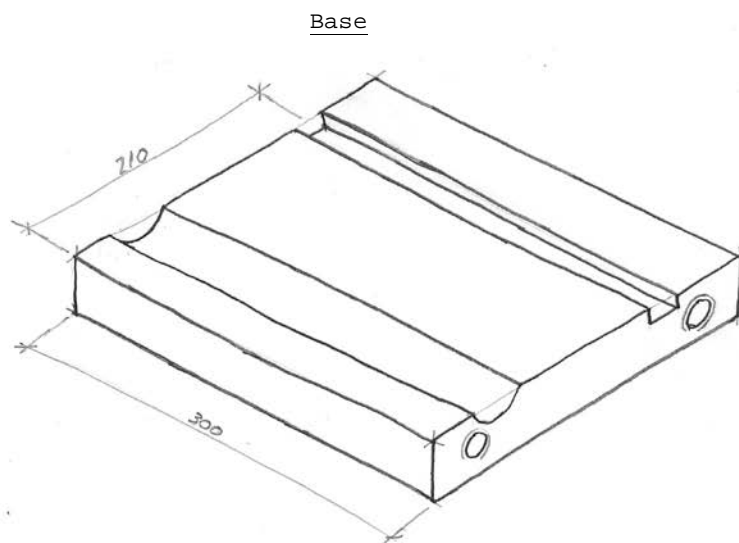
### 5.3. Assembly Design Phase

It is based on the definition of functional forms and dimensions of the assembly's parts. The rest of the dimensions, along with the standardized parts, are treated in the following phase. Also, dimensions that cannot be fixed, because they depend on the parts that will be designed in a later step, will be reviewed later.

The drawings in this phase are sketches which are performed in free format. The aim is to show the geometry of the parts, but with the conditions that they maintain the functional dimensions.

The board in the assembly has the following characteristics:

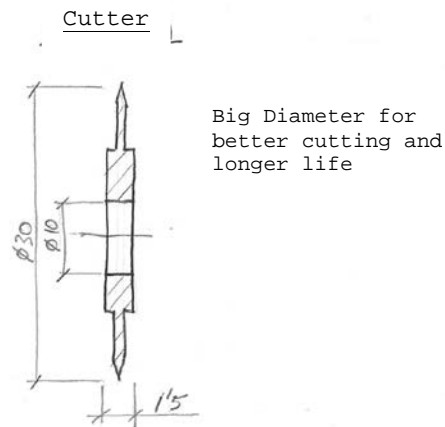
- A4 format.
- Mouth for the paper reel.
- Space for the cutting base



5.5 Image: Board.

The cutter is a fundamental part, and its design must follow those criteria:

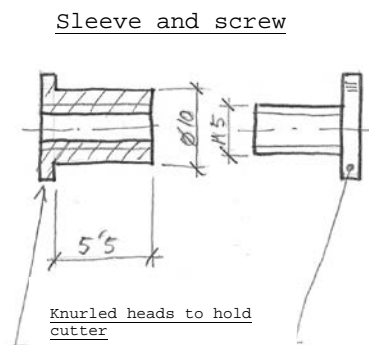
- A big external diameter to obtain a better cut, also incrementing its durability.
- A big internal diameter to roll with accuracy



5.6 Image: Cutter.

The union between the cutter and the holder is by means of a sleeve with inner thread and a screw, with the following conditions:

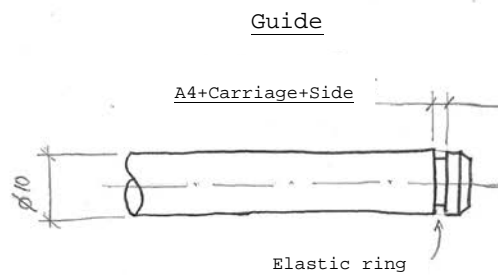
- Heads in both elements will be knurled, to facilitate loosening without tools.
- Using a big sleeve permits an accurate and smooth spinning.
- The length of the sleeve affects the conditions mentioned above.



5.7 Image: Sleeve and screw.

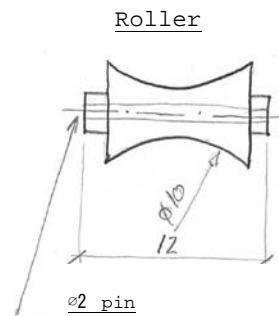
The guide guides the carriage movement. As a consequence, it must suit the following aspects:

- 10 mm diameter.
- Positioned in both holes of the sides.
- Fixed by elastic rings in the sides.



5.8 Image: Guide.

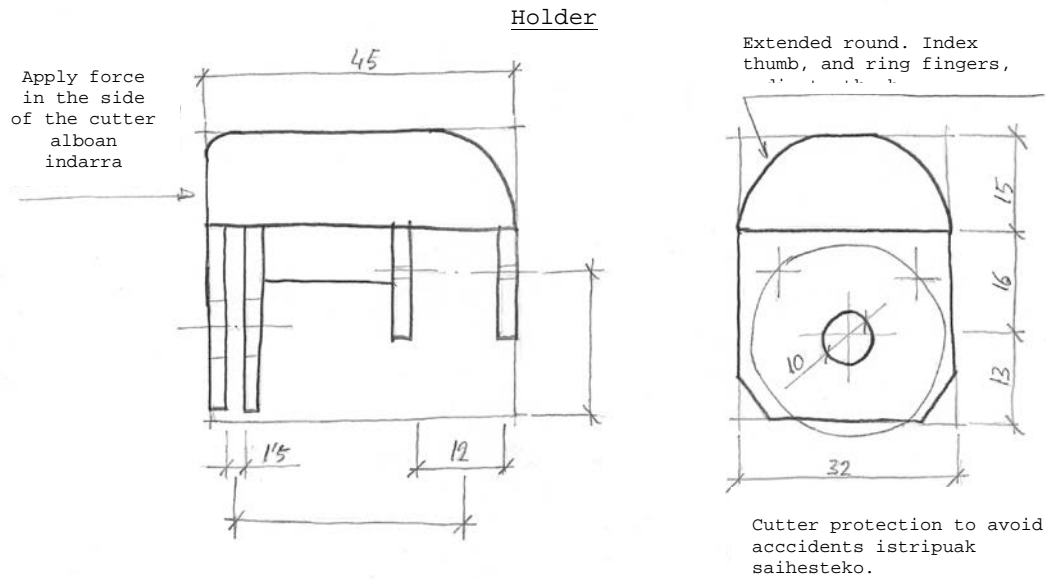
The rollers ensure a smooth movement. They are fixed with holding pins.



5.9 Image: Roller.

The carriage of the shear holds the cutter and moves on the rollers along the guide. Those are the design conditions in its case:

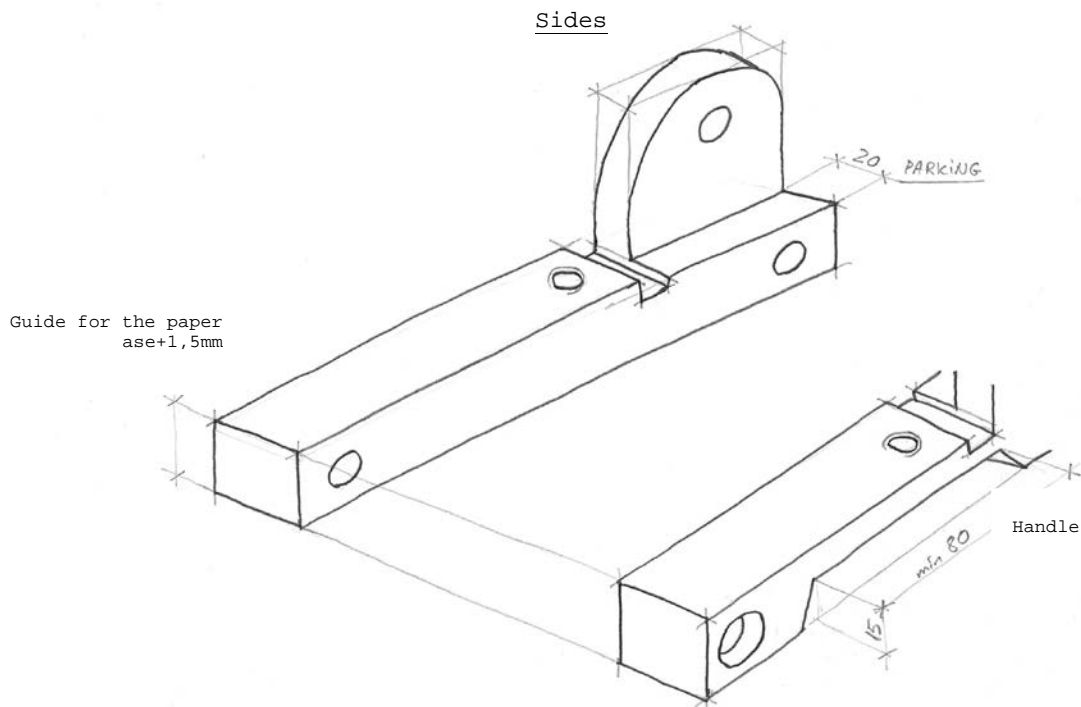
- A rounded upper part for ergonomic reasons.
- An accurate positioning of the cutter and of the roller that ensures a smooth the movement.



5.10 Image: Holder.

The sides have the most complex geometry and also the higher number of functions. They must suit the following conditions:

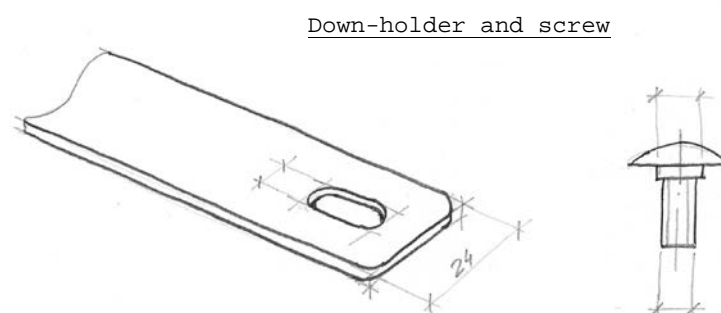
- A parking space for the carriage while charging the paper.
- Guiding the paper to the cutting position.
- Housing for the guide.
- Handle for transport.



5.11 Image: Sides.

The paper holder must be flexible, permitting a deflection up to the same length of the paper-guide and recovering its position next. Those are its design conditions:

- Paper holder to avoid any movement during cutting.
- A width that permits to press with index an thumb
- Slotted holes in the sides that permit bending.
- Fixing screws that permit displacement in the slotted holes.



5.12 Image: -holder and screw.