

THE MANUFACTURE OF THE CARTRIDGE CASE

The design, production, storage and delivery of cartridge cases to factories, user units and individuals place an enormous logistic demand on all military systems. In addition the humble cartridge case ties up an immense amount of money, quite large portions of which are not recovered being lost in the chaos of battle. The cartridge case in most instances is made from expensive materials that are usually in short supply because of competing demands from other industries. The recovery process in itself creates a logistic demand of its own. All the spent cases need to be gathered, sorted, packed and transported back to the factories where they originated.

The storage of cartridge cases generates a technical problem that needs to be addressed during manufacture. Cartridge brass suffers from a defect in that when it is worked in machinery, being stretched and squeezed it develops hardness because of that working. If the stresses induced by this hardness are not relieved during manufacture the brass will develop what is called “season cracking”. It is called this because the problem was first noticed after several seasons in storage. It was eventually realized that it was the unrelieved stresses causing the cracks.



A particularly severe case of season cracking on an Australian .303, even the jacket of the projectile has cracked.

The answer is to heat treat those areas where the brass has been worked thus relieving the stresses. The process is called “annealing” and is noticeable on the necks of cartridge cases as a slight discoloration. Because of the slow nature of the onset of the problem many cartridges have been made without annealing. This is done where the maker knows the cartridge is going to be used in a very short time after production and was common during both world wars. Many cartridges will be found in collections today with cracked necks due to season cracking as they were not used and sat in storage, or collections long enough for the problem to appear.



A clean example of annealing marks on the neck of this 7.62mm ball case. It is easily seen where the heat has been applied to the neck thus relieving the stresses built in during manufacture.



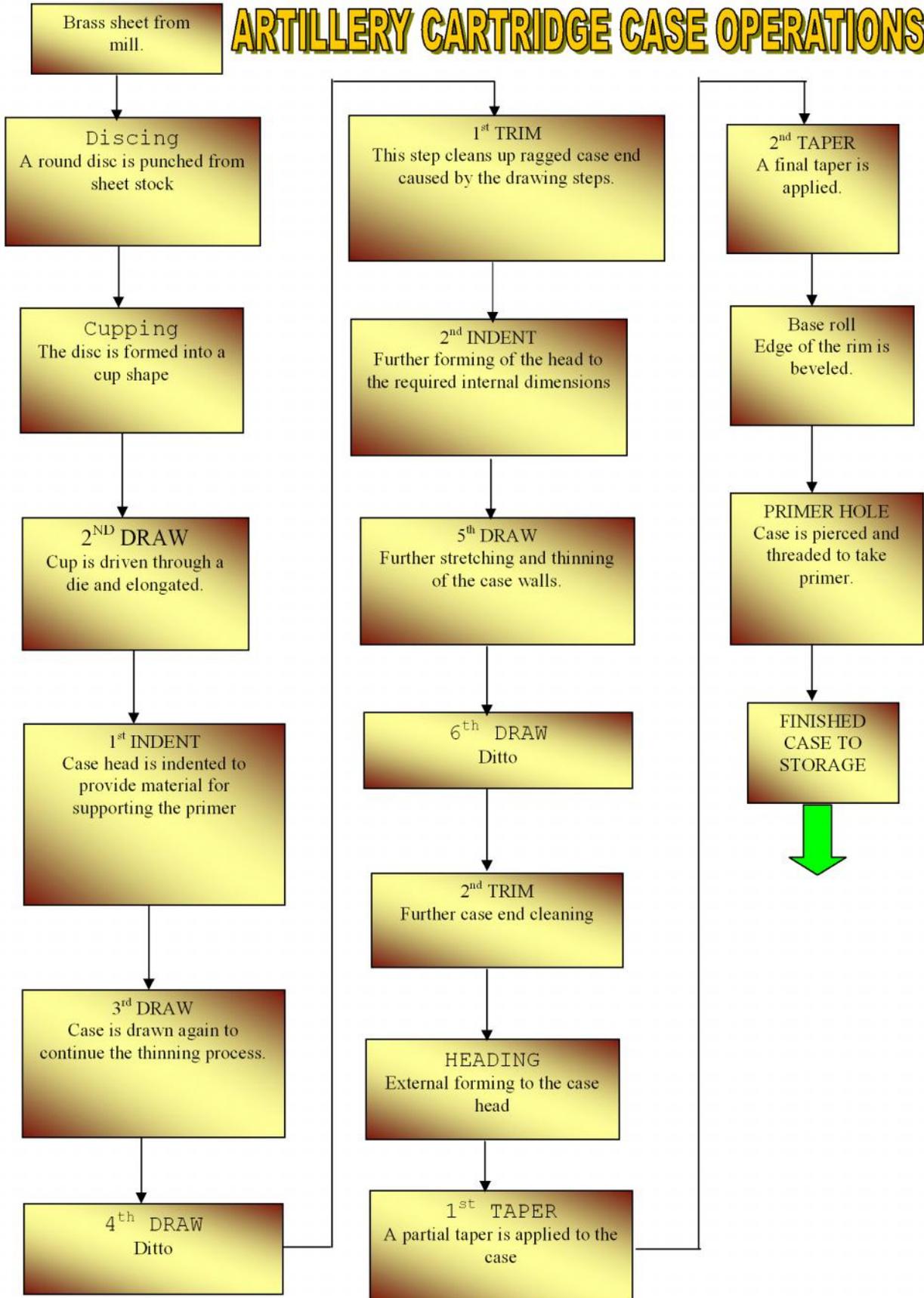
A group of examples of the stages in the manufacture of a 20mm cartridge case. It can be seen just how much stretching is needed to get from the first piece to the last finished case.



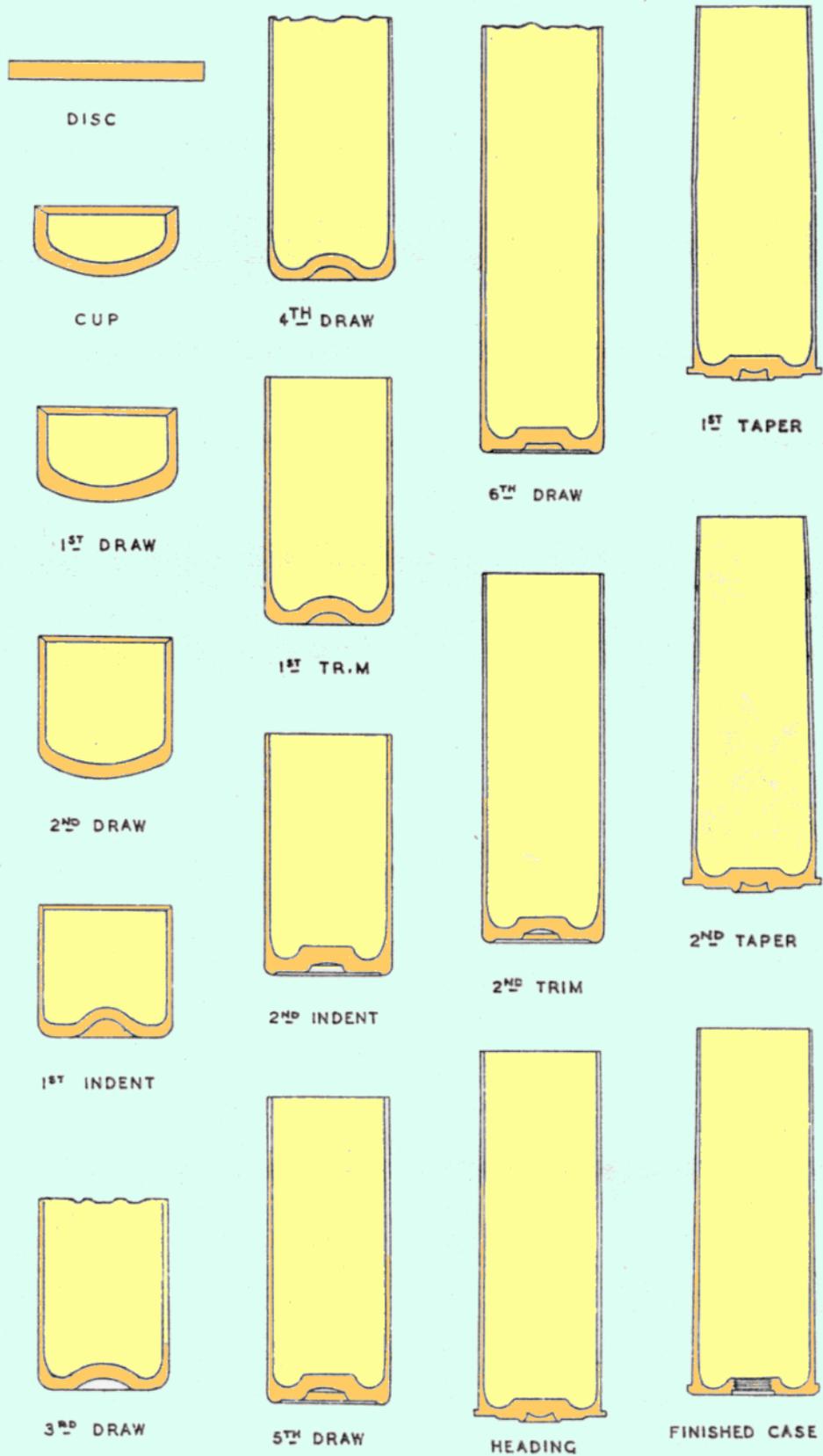
German 25cm
German 105mm
British 2pr.

Some examples of cartridge cases showing the sort of range in sizes that may be encountered

ARTILLERY CARTRIDGE CASE OPERATIONS

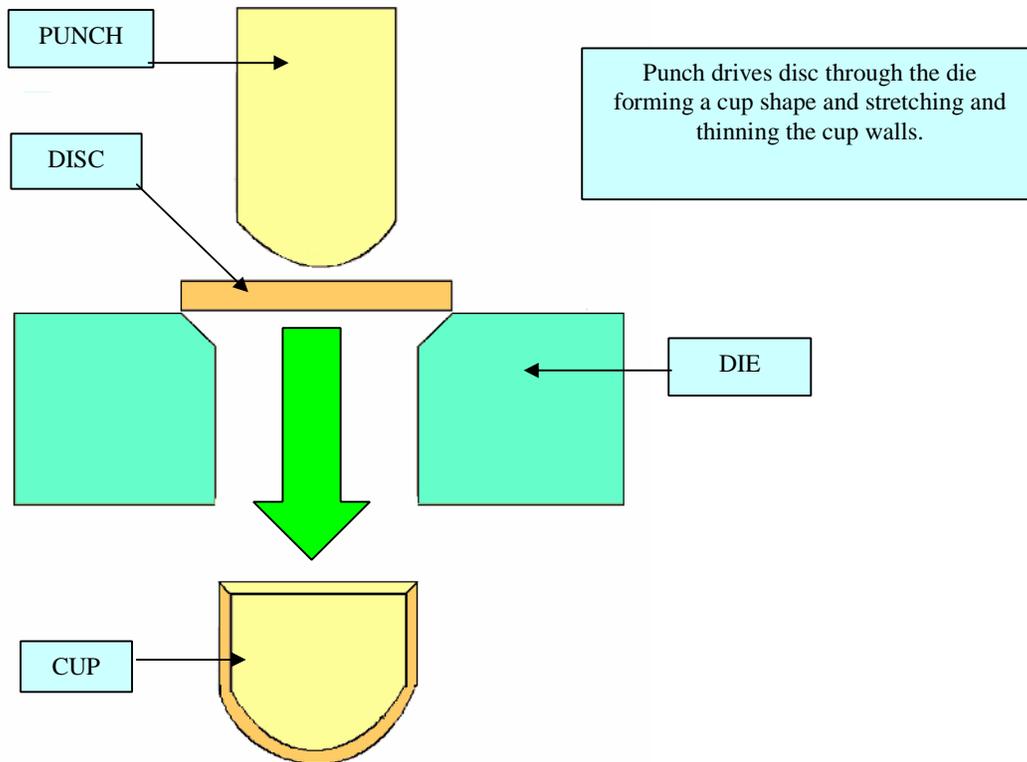


THE STEPS IN THE MANUFACTURE OF A CARTRIDGE CASE



The machinery for doing the various steps in making a cartridge case are many and complicated and involve an immense amount of time and expense. The simplified diagrams below don't even hint at the enormous effort required to produce a safe and reliable cartridge case.

CUPPING



DRAWING

